Coal Age

NOVEMBER, 1955

A McGRAW-HILL PUBLICATION—PRICE 50c

Modern Preparation

Customer satisfaction, smooth operation and provisions for expansion are goals in new plant. p 64

Low-Cost Hoist

How a compact friction-drive AC hoist lifts a specially designed cage in 6-ft-diameter shaft. p 60

Full Contents . . . p 5

Looking Ahead to 1960 . . . p 54

Use the NEW M·S·A MinePhone

to BOOST the EFFICIENCY of your EXISTING HAULAGE SYSTEM

A growing number of mine operators, faced with the problem of increased production "out-running" existing haulage facilities, are finding an economical solution in M·S·A MinePhone installations.

This modern communication system, redesigned and greatly improved, permits operators to *safely* step-up present haulage operations to handle increasing tonnage output and offset major investments for new haulage equipment at the same time.

Because the M·S·A MinePhone provides clear, instant two-way voice communication, all haulage decisions are made quickly. The dispatcher is always in contact with motormen, maintenance repair shops, loading points. Motormen can reply while trips are in motion—trips keep on the move, waits on sidings are minimized. Repair needs are relayed quickly. Over-all safety is improved because one message alerts all personnel at once.

We will be happy to supply you with complete details. Write or call.

Here are the quality components of a single MinePhone Station

(1) HEAVY-DUTY SPEAKER—made of weather-resistant cast aluminum. Volume control built into housing. (2) PRESS-TO-TALK MICROPHONE—high quality transmission; molded neoprene case; Koiled Kord for safety. (3) RECEIVER-TRANSMITTER—single unit, compact. "Squelch" control maintains quiet when not in use, eliminates background noise. Dust-tight steel housing with mounting cradle for quick installation. (4) RESISTOR BOX—reduces trolley wire DC power to requirements for station. (5) IN-LINE POWER FUSE—combination power cut-off and fuse. Waterproof, dust-tight, molded neoprene case houses a 600 volt 3 amp. fuse. All parts built for rugged, long-life service.

M·S·A
SAFETY EQUIPMENT HEADQUARTERS

MINE SAFETY APPLIANCES COMPANY
201 North Braddock Avenue, Pittsburgh 8, Pa.
At Your Service: 76 Branch Offices in the United States

MINE SAFETY APPLIANCES CO. OF CANADA, LTD.
Toronto, Montreal, Calgary, Edmonton, Winnipeg, Vancouver, Sydney, N.S. • Representatives in Principal Cities in Mexico, Central and South America

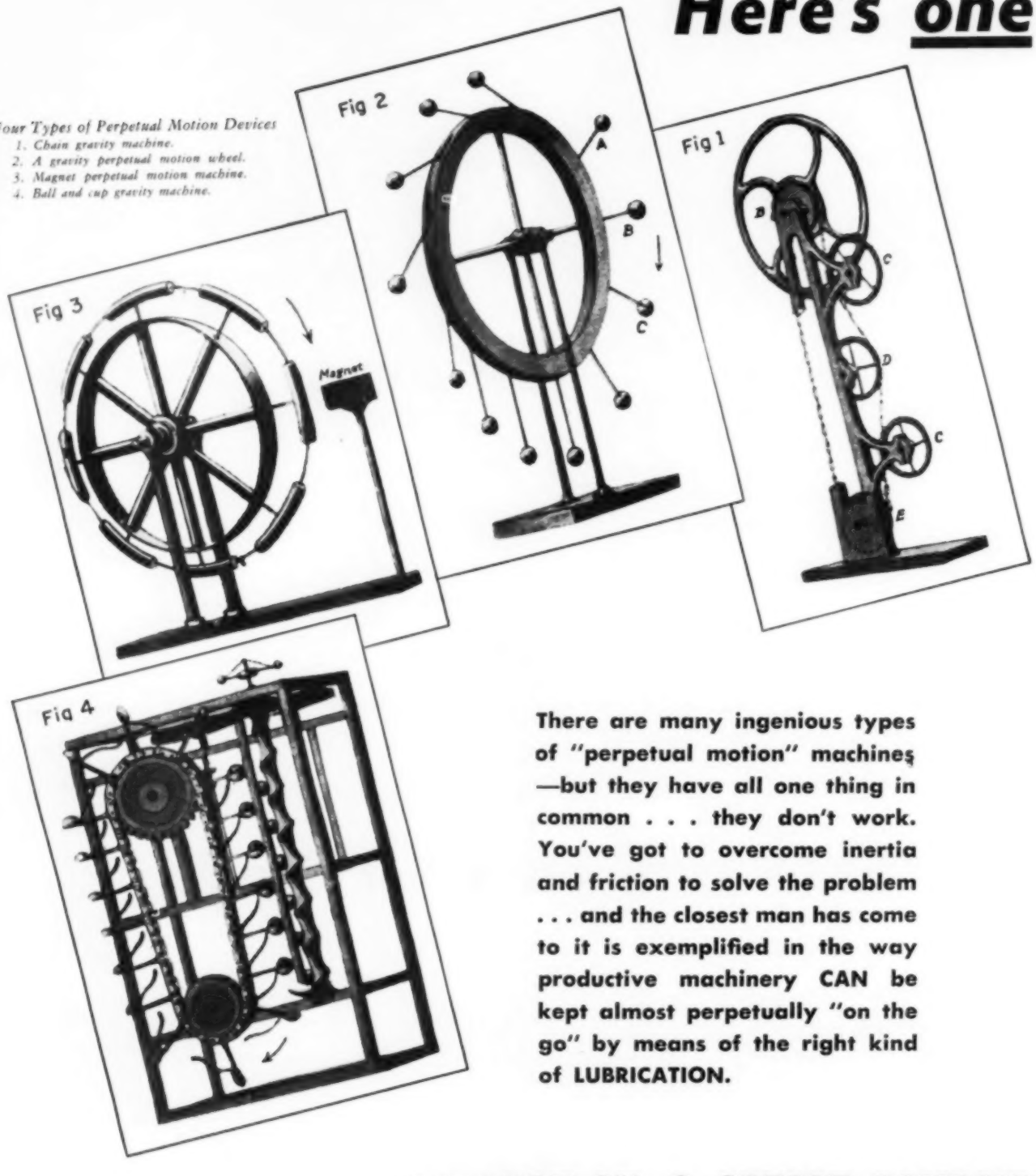
Cable Address "MINSAF" Pittsburgh

When you have a Safety problem, M.S.A. is at your service.

Don't laugh at the notion

Here's one

Four Types of Perpetual Motion Devices
1. *Chain gravity machine.*
2. *A gravity perpetual motion wheel.*
3. *Magnet perpetual motion machine.*
4. *Ball and cup gravity machine.*



There are many ingenious types of "perpetual motion" machines—but they have all one thing in common . . . they don't work. You've got to overcome inertia and friction to solve the problem . . . and the closest man has come to it is exemplified in the way productive machinery CAN be kept almost perpetually "on the go" by means of the right kind of LUBRICATION.

HULBURT OIL & GREASE COMPANY

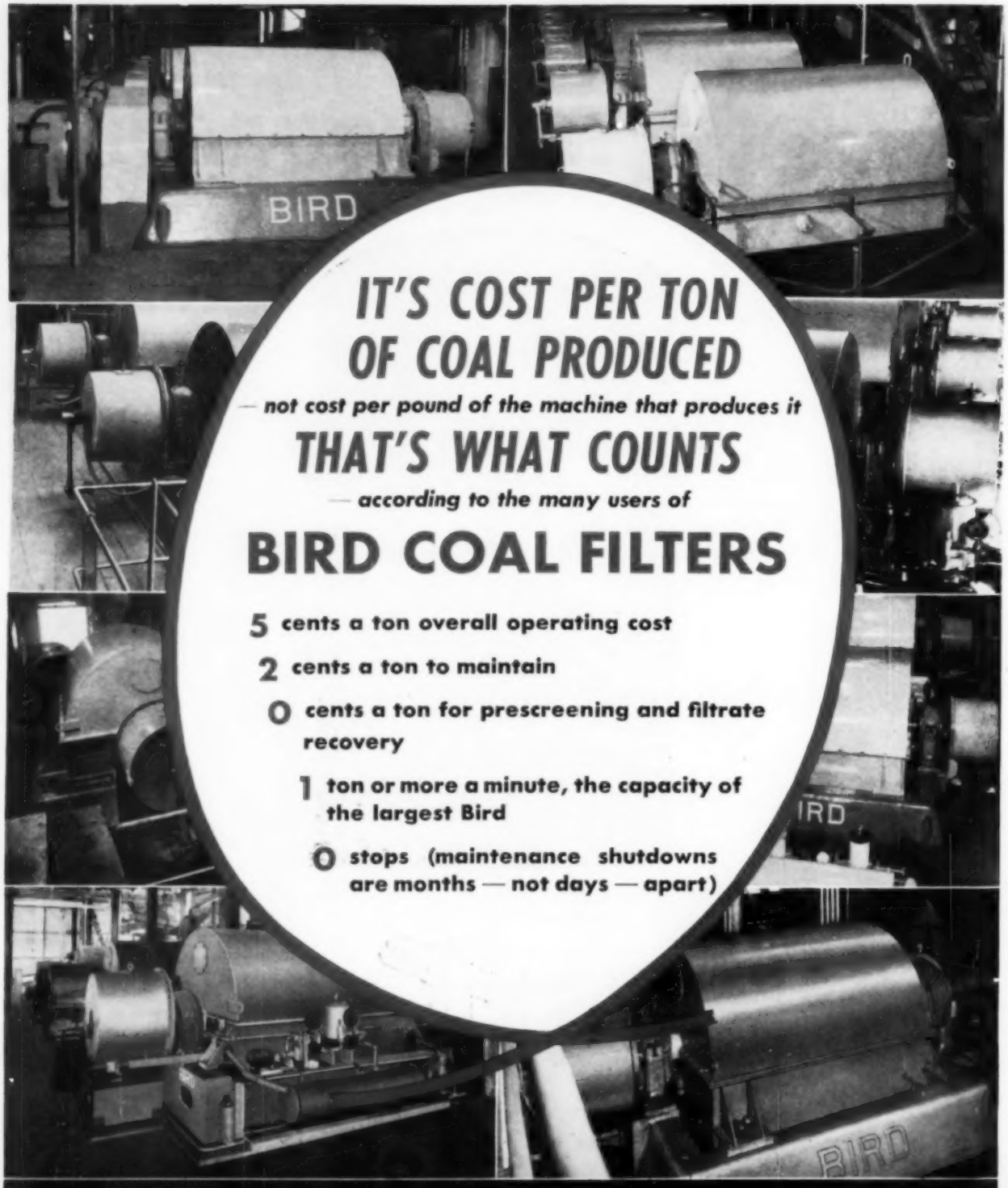
PHILADELPHIA, PA.

Specialists in Coal Mine Lubrication

of "PERPETUAL MOTION"
way to get it in YOUR MINE!

Hulburt
QUALITY LUBRICANTS

Yes, you can come "as close as makes no difference" to keeping mining machines perpetually producing, if you make the right kind of lubrication a MUST in maintenance. That means using HULBURT QUALITY LUBRICANTS. There's no "maybe it'll work" about Hulburt . . . a Hulburt Lubrication Engineer goes down into your mine and shows your men just how to use Hulburt Lubricants to keep your machines working, long and economically and profitably.



IT'S COST PER TON OF COAL PRODUCED

— not cost per pound of the machine that produces it

THAT'S WHAT COUNTS

— according to the many users of

BIRD COAL FILTERS

5 cents a ton overall operating cost

2 cents a ton to maintain

0 cents a ton for prescreening and filtrate recovery

1 ton or more a minute, the capacity of the largest Bird

0 stops (maintenance shutdowns are months — not days — apart)

Let us show you what Bird Coal Filters can do to improve output and economy in your preparation plant. Write for recommendations and estimates.

BIRD MACHINE COMPANY

South Walpole · Massachusetts

REGIONAL OFFICES: EVANSTON, ILLINOIS · PORTLAND, OREGON

Coal Age

NOVEMBER • 1955

In This Issue

Automatic Density Control On Sand-Flotation Cone

New 450-tph Compass No. 2 cleaning plant, Dola, W. Va., featured this month is typical of articles planned on new plants with interesting designs. Compass No. 2. for example, is equipped with a new automatic density control on a 12-ft cone to sample and adjust density of the sand-water mixture in the several zones of the cone. Consistent product quality and elimination of cone plugging are major benefits of the density control. Compass No. 2 circuits, handling Pittsburgh-seam feed, also include tables, centrifugal and heat driers and a closed water circuit employing disk filters and cyclones.

Coming in Coal Age

Large Cars, New Portal

How and why Consolidation Coal Co. (Ky.) selected 25-ton mine cars to achieve one-man operation of main haulage at lowest cost per ton mile at Hendrix mine is the subject of a coming article. And another staff-written offering will tell how Consol (Ky.) constructed a new portal at Mine No. 214 to increase efficiency for the remaining life of the mine and permit maximum salvage of portal facilities.

Extensible Belt In Long Rooms

A Pennsylvania producer cuts development costs by driving 900-ft-long rooms using an extensible belt conveyor for room transportation and conventional machines at the face.

Gist of the Meetings

Staff-written reports of important Fall meetings, coming in the December issue *Meeting Roundup*, will keep you abreast of what's going on right now in coal's major activities.

COAL AGE NOVEMBER, 1955
VOLUME 60 NUMBER 11

(with which are combined The Colliery Engineer and Mines and Minerals)

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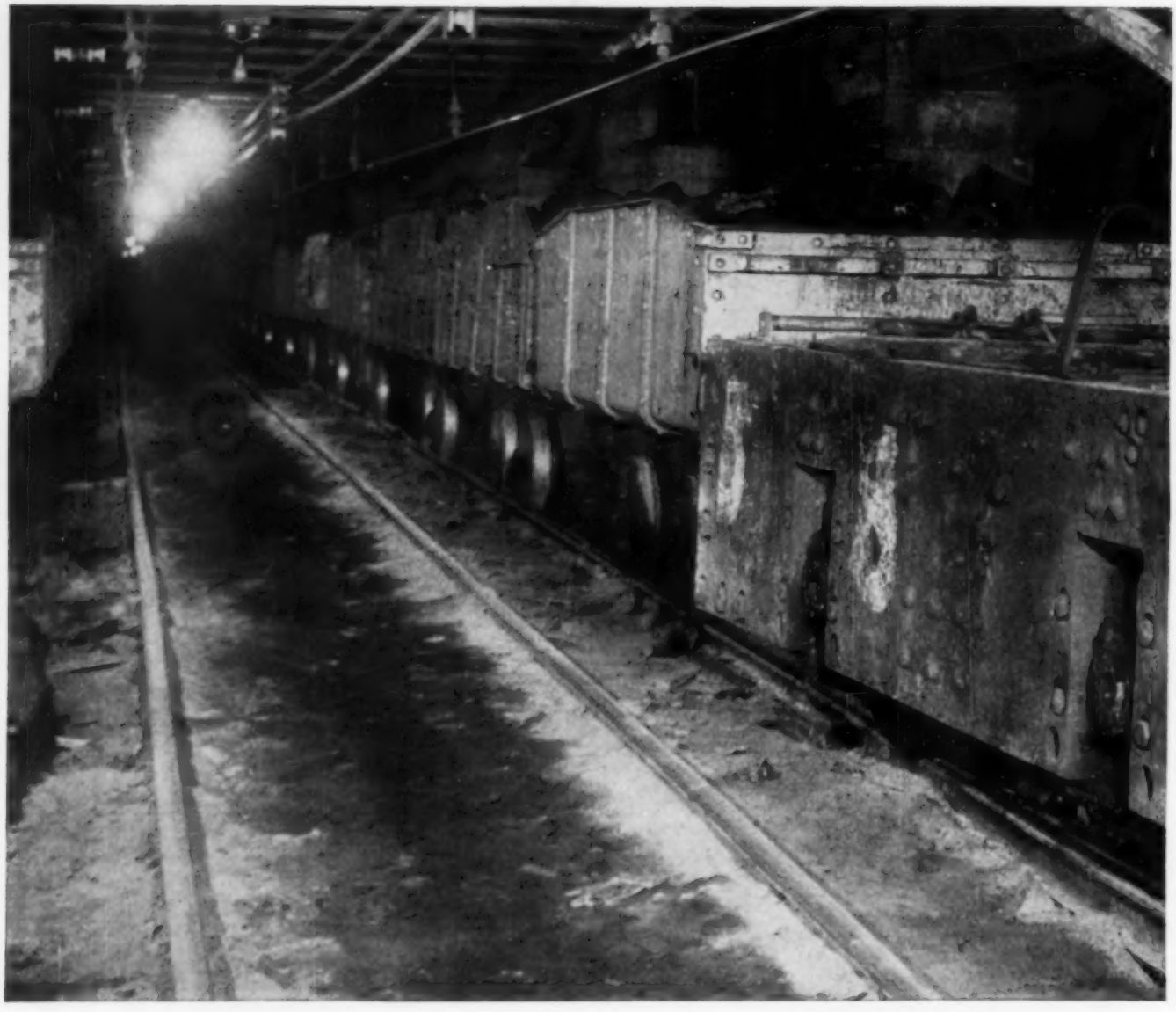

Even the longest

WHEN YOU lubricate mine car wheels with *Texaco Olympian Grease,* you get easier, smoother starts the year 'round — no matter how heavy the loads. That means your locomotives can haul longer trains, more tonnage.

Texaco Olympian Grease assures low maintenance costs, too. It is especially made to stay in the bearings under all conditions. Thus, bearings get an extra measure of protection against dirt, moisture and wear. Moreover, *Texaco Olympian Grease* effectively resists oxidation, will not separate in use or storage.

Texaco Olympian Grease is available in three consistencies — to meet every requirement of plain, cavity hub or anti-friction bearings.

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TEXACO STAR THEATER
starring
JIMMY DURANTE
on television . . .
Saturday nights, NBC.

TEXACO

TEXACO

trains start easier...

For simplified, effective lubrication of anti-friction and sleeve-type bearings in locomotives, cutters and other equipment, use new *Texaco Multifak*. This fine multi-purpose grease remains stable over a wide temperature range — pumps easily even at low temperatures — resists oxidation, water and rusting.

High efficiency and low costs can be yours with the help of effective Texaco lubrication. Get full details from a Texaco Lubrication Engineer. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICANTS for the Coal Mining Industry

more performance . . .
FOR SUSTAINED HIGH OUTPUT!

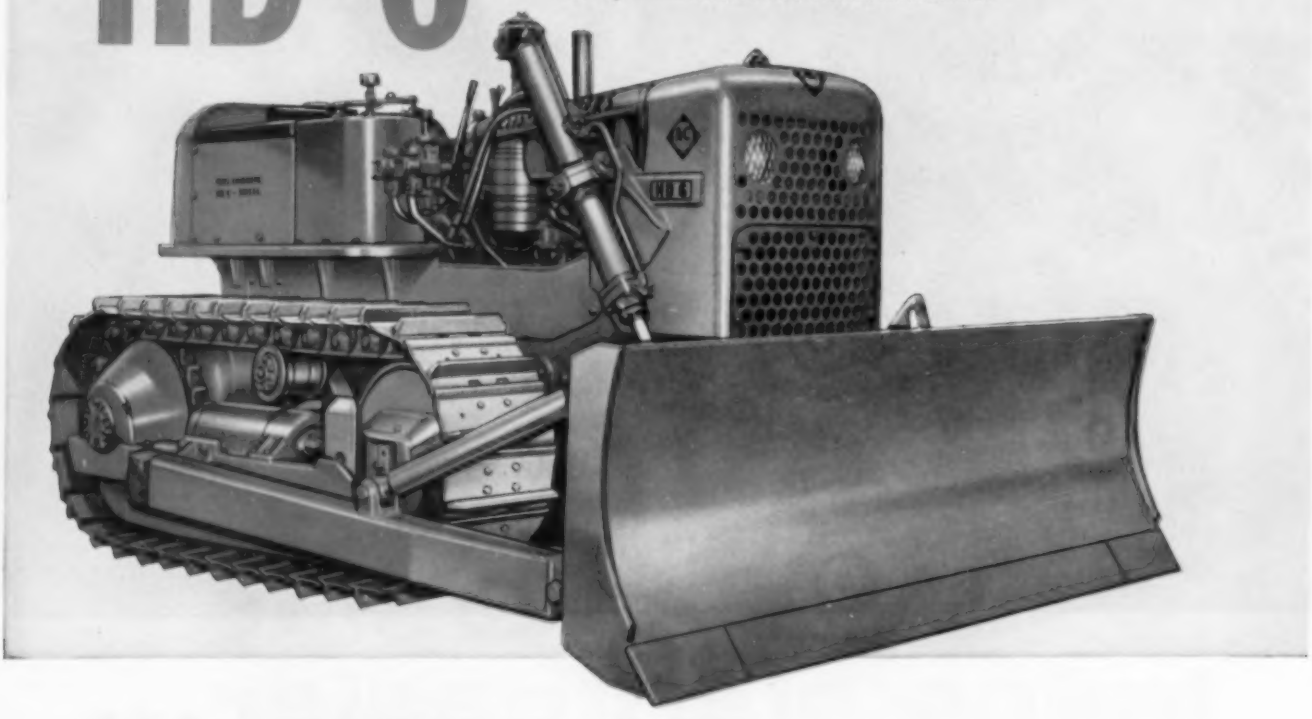
more versatility . . .
FOR A WIDER RANGE OF WORK!

more dependability . . .
FOR LOWER JOB COSTS!

TWO NEW HD-6

BULLDOZER-DRAWBAR TRACTOR

Weight	12,400
Drawbar hp	45
Belt hp	55



STEP UP PERFORMANCE, CUT JOB COSTS WITH EXCLUSIVE HD-6 FEATURES LIKE THESE . . .

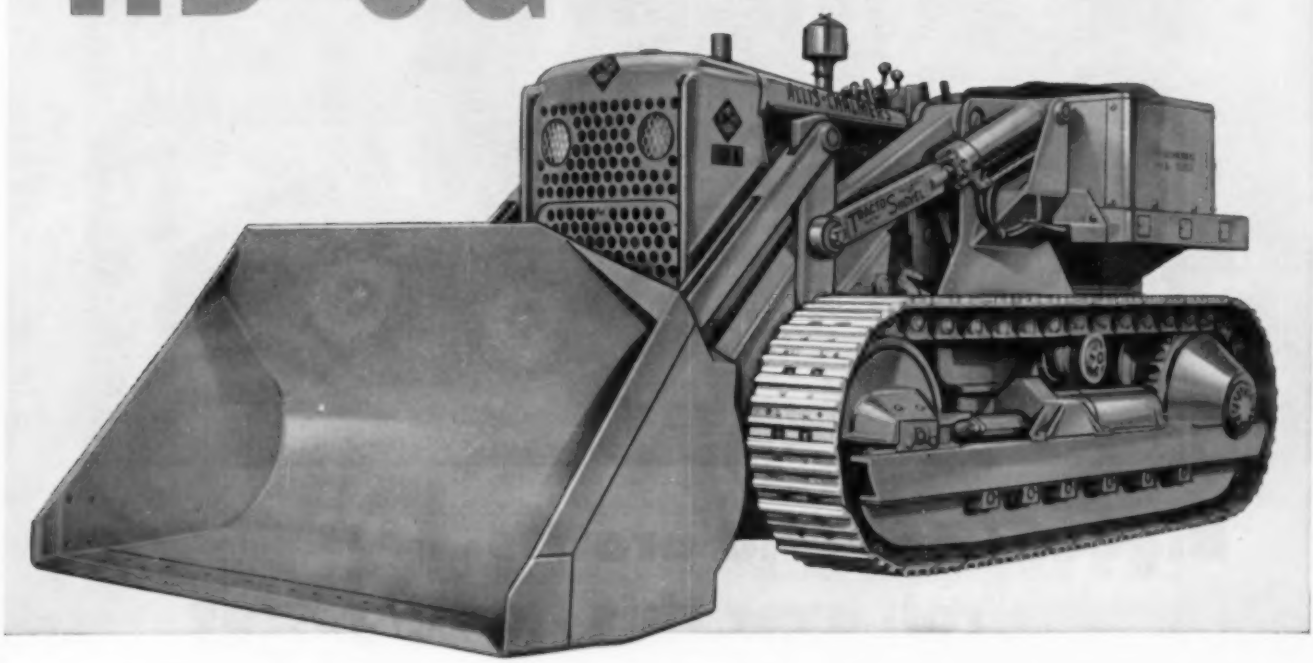
- ★ Allis-Chalmers heavy-duty diesel engine — with "follow-through" combustion for long life, low upkeep.
- ★ 24-volt direct electric starting — for convenience and efficiency (standard equipment).
- ★ Wrap-around radiator guard for maximum strength and protection . . . tilts forward for easy service.
- ★ *Ceramic* master clutch lining — lengthens clutch life, reduces lever pull.
- ★ All-steel box-A main frame — protects the entire power train, makes possible superior balance . . . plus the service simplicity of unit construction.
- ★ One-piece steering clutch and final drive housing — for maximum strength, accurate bearing and gear alignment.
- ★ Double reduction final drives (straddle-mounted on tapered roller bearings) provide maximum ground clearance.
- ★ Roller bearing truck wheels — with Positive Seals that keep dirt and moisture out . . . grease in.
- ★ 1,000-Hour lubrication intervals for truck wheels, idlers and support rollers.
- ★ Tru-Dimension tracks — with new standards of strength and hardness *throughout* for extra wearability.
- ★ Unit construction — major assemblies like engine, clutches and final drives can be removed without disturbing adjacent parts.
- ★ Engine-mounted bulldozers — for top dirt-moving performance and extra tractor life.

ALLIS-CHALMERS ANNOUNCES
HD-6 SERIES TRACTORS

HD-6G

TRACTOR SHOVEL

Weight	19,600
Drawbar hp	45
Net engine hp	57
Bucket capacity	1-1/3 cu yd



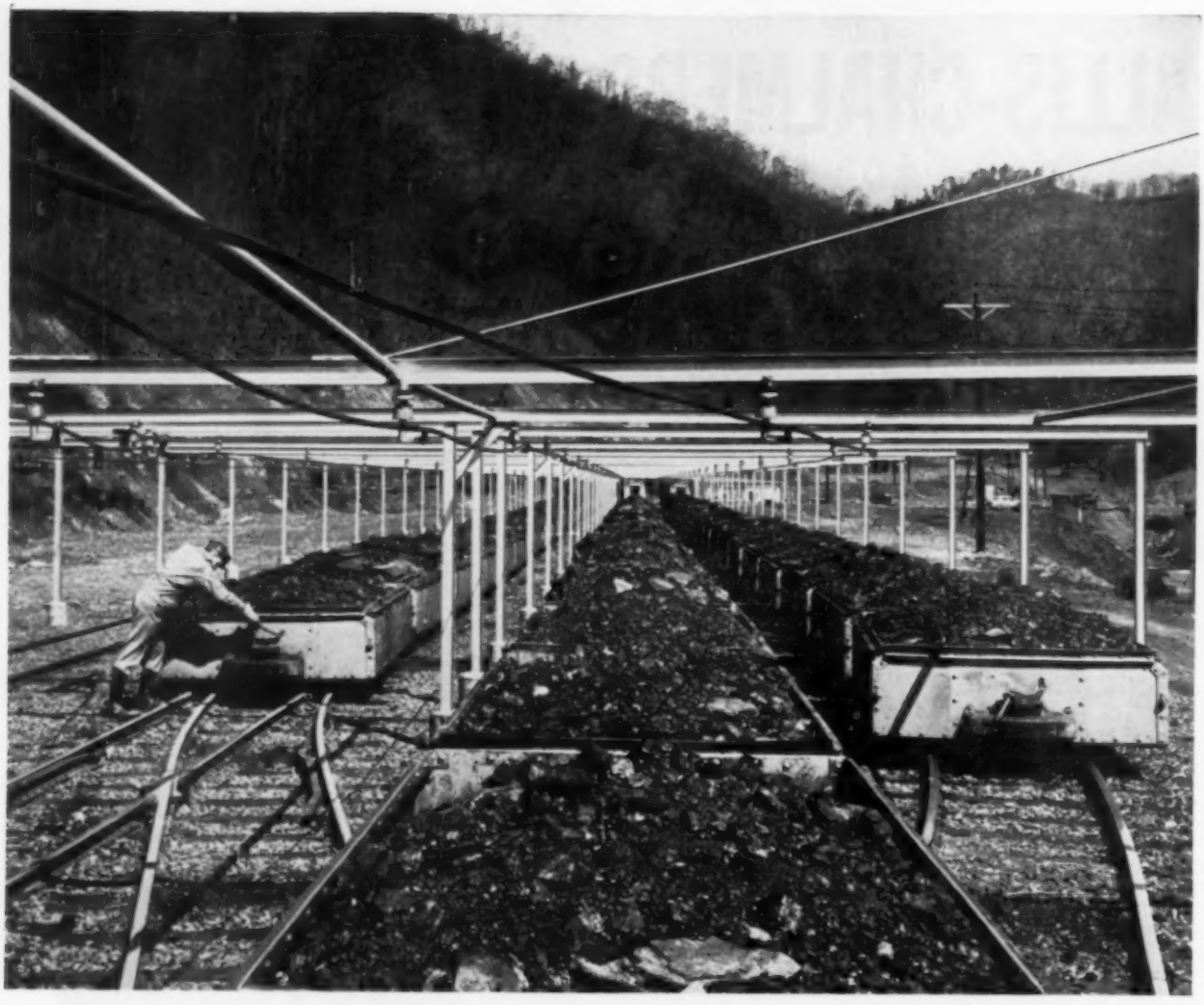
...PLUS TRACTOR SHOVEL FEATURES LIKE THESE...

- ★ Extra long track (almost 7 ft on the ground) with six truck wheels per side — for real stability throughout the digging and loading cycle.
- ★ New two-position bucket — for easy full-capacity loading in any material (standard equipment).
- ★ Heavy-duty shovel assembly — built right into the tractor, not just an attachment.
- ★ Simple, safe hydraulic system — with no exposed hoses or fittings on cowl or deck.
- ★ Two-speed reverse, high foam-rubber seat and easy bucket control — for new tractor-operator efficiency.

GET ALL THE FACTS NOW FROM YOUR NEARBY ALLIS-CHALMERS DEALER

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS



Bigger trips and profits roll over this haulageway

This is a recently modernized track system in West Virginia, with the accent on heavy rail and railroad-like construction. Significance: trips are longer, faster and more economical. Maintenance costs are lower. The gap between the cost of mining and the return is wider.

When the owners of this mine made the decision to renovate, they handed the trackwork problems to Bethlehem. They knew Bethlehem had the practical mining men to design a workable layout. And they knew Bethlehem would follow through all the way from drawing board to pre-assembling each track component for perfect fitting and no wastage. Bethlehem has tailor-made many mine haulways throughout the coal regions. And all these layouts embody Bethlehem's forward-looking principles, designed to haul coal profitably not just for today but for years and years to come.

If you see room for improvement in your mine trackwork, perhaps the time has come for you and one of our engineers to get together and talk things over. He will be glad to arrange a meeting at your convenience. You can reach him through the Bethlehem office nearest you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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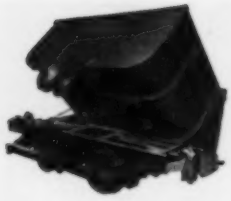
BETHLEHEM STEEL

BETHLEHEM STEEL



for safety and speed
of coupling
in all types of mine cars
and locomotives

WILLISON
automatic
COUPLERS

Over 100,000 Willison Automatic Couplers have been installed in cars and locomotives engaged in mining operations, industrial plant hauling and foreign railway service. And the number is continuing to grow every day.

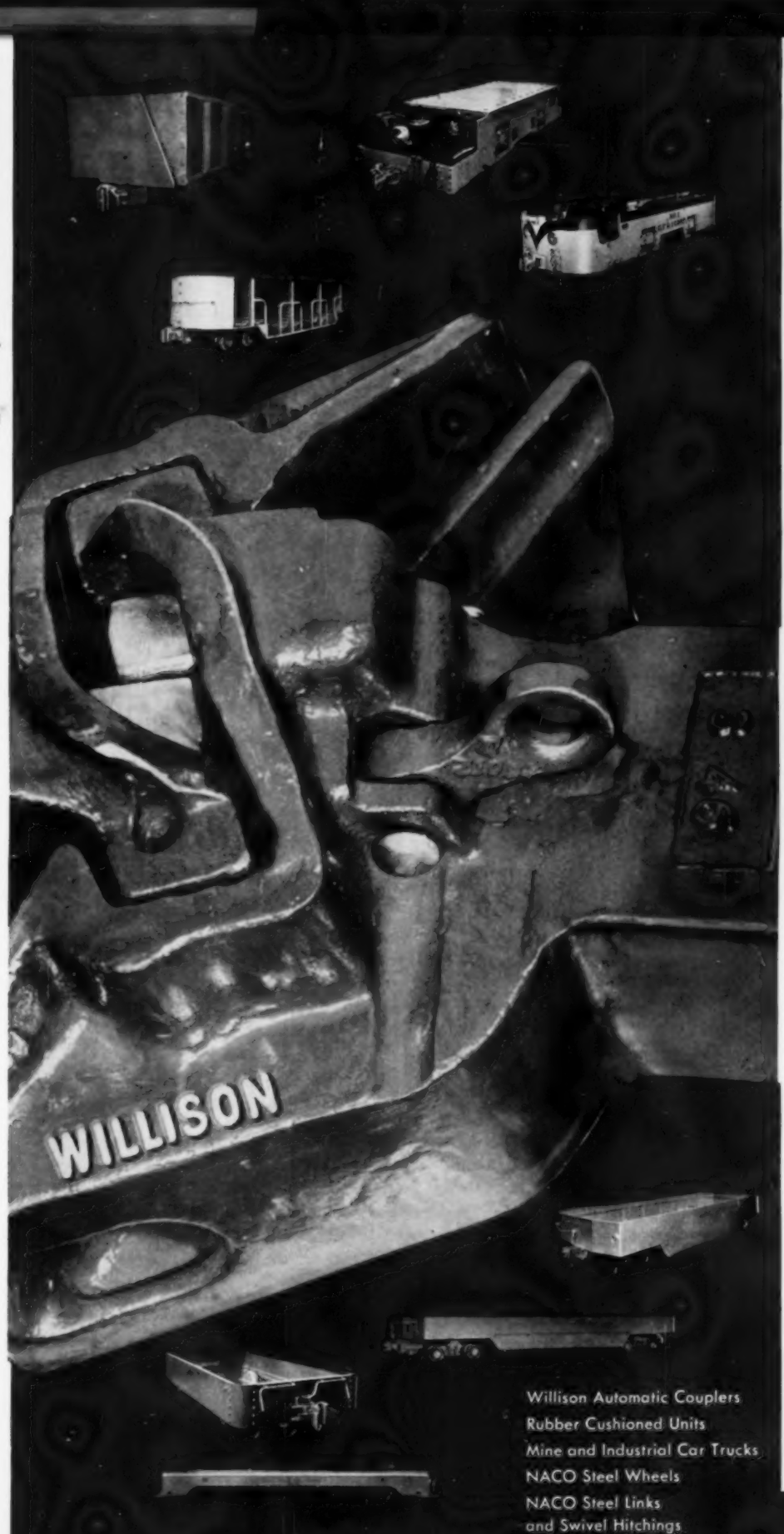
That's because operators know that with Willison Automatic Couplers you get three inherent advantages:

Safety —Since Willisons couple automatically and require no manual assistance, there is no need for men to go between cars.

Speed —Automatic operation and self-aligning feature speed coupling operations.

Strength —Willison Coupler heads take the full buff and pull forces. Strength does not depend on intermediate parts such as knuckles, pins and latching devices that are subject to failure.

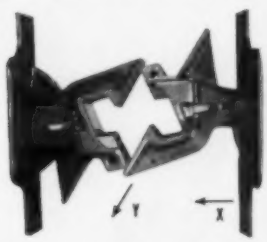
If your operation involves haulage with cars of virtually any type in the 1 to 30-ton range, investigate the "3S" advantages—Safety . . . Speed . . . Strength—of Willison Automatic Couplers.



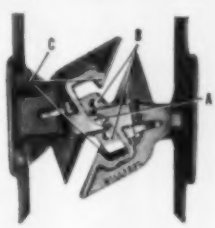
Willison Automatic Couplers
Rubber Cushioned Units
Mine and Industrial Car Trucks
NACO Steel Wheels
NACO Steel Links
and Swivel Hitchings

How the WILLISON COUPLER Works

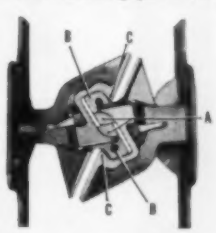
1. Wide gathering range of the Willison allows automatic coupling even under extreme curve conditions. Simple four-part construction cuts maintenance and parts problems.



2. Pressure of one coupler against the opposite coupler forces the two into correct coupling position as train movement (X) aligns couplers (Y).



3. Locks (A), pushing against each other, retract into coupler head and permit lugs (B) to slide along coupler face into interlocking jaws (C).



4. Locks (A), having cleared each other, return to locked position without pre-setting or manual assistance; lugs (B) are now held interlocked with jaws (C).

NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY

CLEVELAND 6, OHIO

Circular 5154, Willison Automatic Couplers and Multi-Pad Cushioning Devices, available on request.

SLOTTED BOLT...OR HEADED BOLT

either one gives you a sound, dependable roof

Mine roof bolts minimize the possibility of serious roof falls, as well as increasing production through more efficient use of mechanized equipment. Bethlehem makes mine roof bolts in two types: (1) a slotted bolt, used with a wedge, and (2) a headed bolt, used with an expansion shell.

Either type supplants old-fashioned supports, and can be used in conjunction with roof plates and Bethlehem roof ties. If you'd like more information about how these bolts can be used in your safety program, please call the nearest Bethlehem sales office.

SLOTTED BOLT An ideal roof bolt where maximum strength is desired. Also suitable for pillar bolting. Comes with 6-in. slot, forged without loss of metal, and a steel wedge. Opposite end of bolt has 5 in. of rolled threads. Wedge is forced deep into slot, spreading bolt ends, when bolt is driven.

SQUARE-HEAD BOLTS (Used with expansion shell) Furnished in three types: a ¾-in. carbon-steel bolt and a ⅝-in. high-strength bolt, each with typical breaking load of 24,000 lb, and a ⅞-in. high-strength bolt, with a typical breaking load of 45,000 lb. These bolts are used with hardened washers, which prevent tearing of metal when pneumatic impact wrenches are used.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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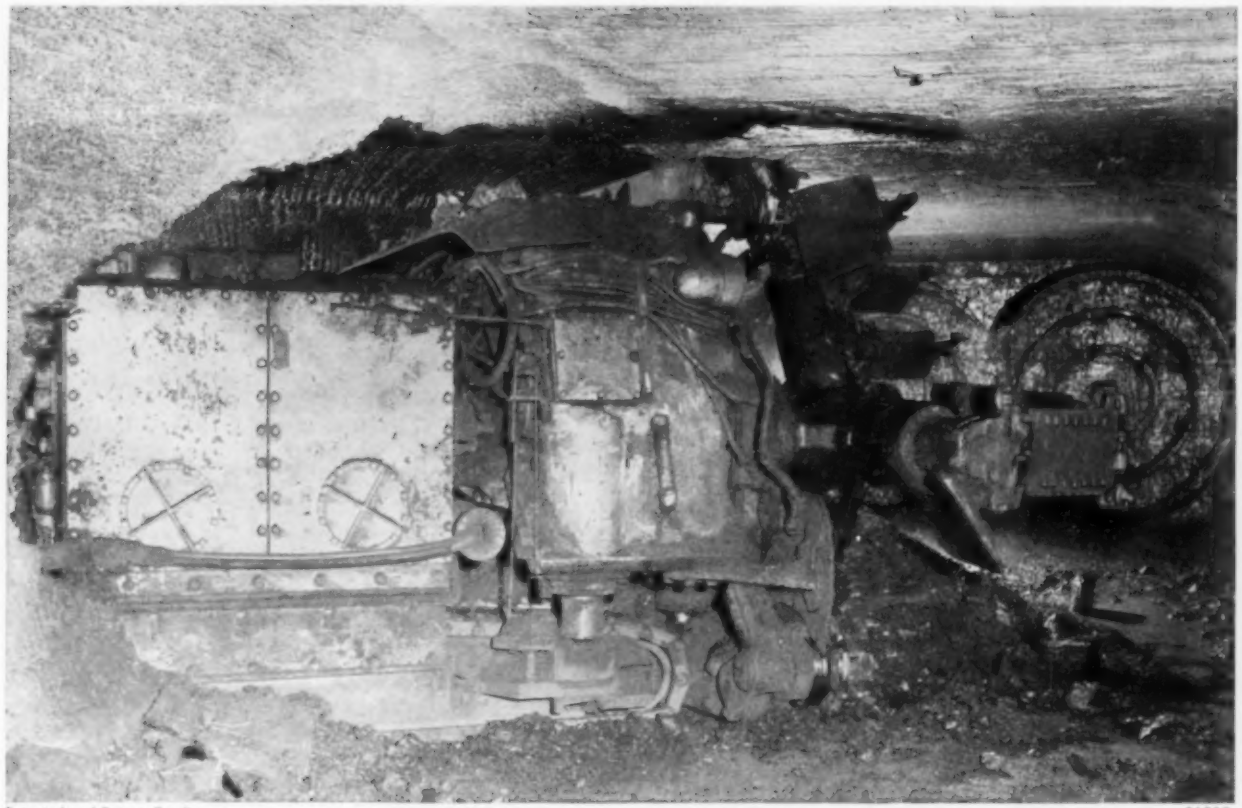


Patented and Patents Pending 21238

UP TO 8 TONS OF COAL CUT AND LOADED . . . *per minute!*

This coal cutting and loading rate is a fact—not theory—provided by production records in coal mines where Goodman Boring Type Continuous Miners are in operation. And you can consistently maintain a high productive rate as Goodman Miners bore in a continuous advance. Further, the percentage of coarse coal produced is high. Dust during the entire operation is kept to a minimum, readily spray controlled.

Goodman Miners promote concentrated working areas . . . require fewer man hours, less supervision . . . substantially reduce your cost of installing, maintaining and extending roadways, roof support and power lines.

Smooth, undisturbed roof and sides are left by the Goodman Miner. Bottom immediately ready to serve as roadway. 21243

Operators like the maneuverability of a Goodman Boring Type Miner, too. It's suitable for all development work, including 90° crosscuts, and for complete pillar extraction. It follows seam irregularities by vertical or sideways tilt of cutting element—retracts cutting elements for tramming clearance at top, bottom, sides—has full hydraulic control of all machine movements for ease of handling.

If it's your responsibility to see that coal mining costs are kept down, you'll want the full story on the Goodman Boring Type Continuous Miner.

Write today for Catalog No. G-107 . . . no obligation.

GOODMAN
MANUFACTURING COMPANY
Halsted Street and 48th Place, Chicago 9, Illinois

CUTTING MACHINES • CONVEYORS • LOADERS
SHUTTLE CARS • LOCOMOTIVES • CONTINUOUS MINERS

. . or on the surface with Dumptors

Trackless mining — Hauling zinc ore from underground mine to railroad siding, 3 Koehring Dumptors ramp-load directly into cars. On this trackless haulage operation, the 6-yard Dumptors are loaded underground by a tractor-shovel. They travel along tunnel to an inclined haul-way, where they have an 1100-foot climb up 11½% grade to the mine entrance. Production for the 3 heavy-duty haulers has averaged 500 tons of ore a day — and the mine foreman reports that maintenance has been "almost nil". It's easy to see why. For one thing, Dumptors have no troublesome body-hoists. *Gravity* dumps the load — and gravity-dump never balks, never wears out.

14 Dumptors in one mine —

On extensive open-pit stripping to uncover lithium deposits, rocky overburden is hauled by a fleet of 14 Koehring Dumptors. They also carry ore from pit to stockpile. Excavating is handled by tractor-type loaders and power shovels. Notice how Dumptor's big square body opening and low rear entry permits fast loading over the end or sides.

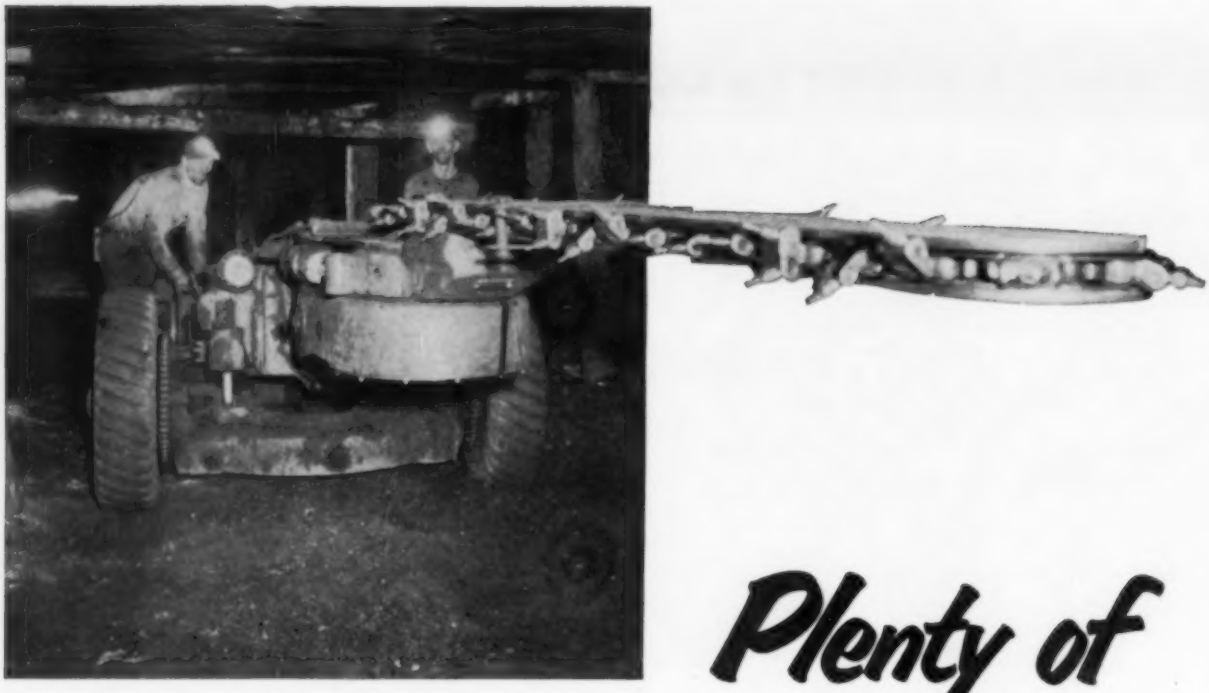
Up-hill haul all the way —

Teamed with a Koehring 1½-yard shovel, 3 Dumptors haul up steep grade out of pit, then climb ramp to dump. These off-road 6-yard Dumptors have better than 6 h.p. per ton of loaded weight. They accelerate fast, pull through soft ground, up grades with less shifting, climb 24% grades fully loaded.

Prospecting for pay dirt —

At exploratory mine in the Rocky Mountain region, Dumptor goes underground, shuttles in and out of access tunnel without turning. There's no need to turn, because Dumptor has 3-speed travel in either direction — operates with equal ease coming or going. It's as efficient underground as it is on overhead trestles, or hauling along the surface.

If your work involves hauling rock, gravel, ore and other materials under difficult conditions, let your Koehring distributor show you what this 6-yard heavy-duty Dumptor® can do for you.



Plenty of Mining Experience behind these Carbide Bits

Write for your copy of the CARMET MINING TOOL CATALOG

This informative 16-page booklet gives complete data, sizes, etc. on all styles of Carmet carbide-tipped cutter and drill bits. Also included is a valuable methods manual on reconditioning methods and equipment. Your copy gladly sent free on request.

ADDRESS DEPT. CA-71

Carmet carbide bits were developed and proved *the hard way* . . . through years of service in every conceivable mining condition and in every mining area. Case histories vary considerably due to local conditions—but no matter what your cutting or drilling problems may be, we can show you records of superior performance by Carmet bits under similar circumstances.

As a direct result of this field-proved background, Carmet bits offer you several distinct advantages. One is the unusually wide range of selection: 20 different styles of cutter bits, 2 styles of finger bits, 2 styles of roof bolting bits, 3 styles of auger bits. More bits to pick from means a closer match with *your* conditions—means savings for you in time and bit costs. Another advantage was *pioneered* by Carmet . . . it's the overlaying cap of steel that double-bonds each carbide cutter tip firmly in its seat, guarding against tip loss and reducing side drag and power consumption.

How about giving Carmet bits a trial? Both we and your local distributor will be glad to cooperate with you. ***Allegheny Ludlum Steel Corp., Carmet Div., Wanda and Jarvis Aves., Detroit 20, Michigan.***

The Original DOUBLE-BONDED Carbide Bit

CARMET® AL

W&D 9444

Remove Snap Ring

Remove Chuck

THE CLEVELAND S20 VAC-NU-MATIC STOPER

All models available in either SAV-A-CHANGE or Socket Type Chuck

● The new CLEVELAND S20 VAC-NU-MATIC dust collecting stoper is available in 3 feed lengths to suit any working height down to a 26" seam. *It will produce a 30" hole in a 26" seam without using coupled steel.* The 28" feed weighs 69 lbs. complete. Any model may be used either hand held or jumbo mounted. VAC-NU-MATIC bits are fast and free cutting and eliminate all stuck steels. Dust collection is positive even in wet top. Chucks may be replaced without dismantling the machine, using only a pair of snap-ring pliers. Cuttings are removed at the chuck housing and do not pass through the machine. Write for bulletin RD32 or let us demonstrate in your own mine.

For sales, service, information or demonstration in Pennsylvania and West Virginia contact: Schroeder Brothers — 3116 Penn Ave., Pittsburgh, Pa. or Acme Machinery Co. — Williamson, W. Va. In the Birmingham district contact Equipment Service Co., 617 North 9th St., Birmingham, Ala., or contact us direct from anywhere.

CLEVELAND ROCK DRILL DIVISION
Westinghouse Air Brake Company
12500 BEREA ROAD • CLEVELAND 11, OHIO

RD-74

FAST!

that's the word for Bucyrus-Erie dig-swing-dump cycle

High-speed performance in Bucyrus-Erie excavators doesn't depend entirely on super-skilled operators or ideal digging conditions. It's the result, too, of engineering that offers features like these: anti-friction bearings to smooth the path of power . . . fast-acting controls that are pinpoint accurate and easy to operate . . . big, generously-designed clutches and brakes that deliver instant response with an extra margin of safety . . . strong, lightweight front end that puts power to work swinging payload, not deadweight . . . wide, ground-hugging treads with large bearing area for the kind of stability that makes rapid operation possible.

With all their speed of operation, Bucyrus-Erie excavators still deliver long life and low maintenance. Mining and quarry men have learned to depend on Bucyrus-Erie machines—from ⅜ to 4-yd.—for efficient, low-cost production. See your nearby distributor soon for complete details. 122E55

BUCYRUS ERIE
South Milwaukee Wisconsin

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YEARS OF SERVICE to Men Who Shape the Earth

OVER 30 YEARS OF BETTER PROFITS for Coal Operators 'round the world

Ask

the men who know coal
from the ground up

McNALLY PITTSBURG
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburg Manufacturing Corporation—Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio
Engineering and Sales Offices: Pittsburgh • Chicago • Rio de Janeiro • Pittsburg, Kansas • Wellston, Ohio

FIRST CLASS
PERMIT No. 93
(Sec. 34.9, P. L. & R.)
PITTSBURG, KANSAS

BUSINESS REPLY CARD
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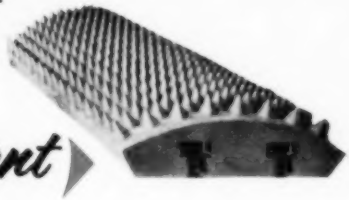
4c-POSTAGE WILL BE PAID BY—
McNally Pittsburg Mfg. Corp.
PITTSBURG, KANSAS

Compete for the BIG PROFITS Sooner!

Get FAST Delivery on ALL your Coal Preparation Equipment

from a ***Complete Plant*** *to a* ***Crusher Segment***



Once you decide to modernize your plants for the big profits in today's competitive coal market, you'll want fast delivery. You'll want equipment that will start right in making money for you. If package additions are all that you need, you'll want to be confident that suppliers' engineers have the know-how to quickly integrate them into your present layout with a minimum of cost and delay.

Your answer is McNally Pittsburg one-stop service. Here is everything for every coal preparation operation from the ground up. For the large plants, for the small plants; whether small or large additions to your present facilities, you'll get dependable fast delivery when you specify time-tested McNally Pittsburg equipment. Send post card now for complete information.

- ✓ BACK STOPS
- ✓ BEARINGS
- ✓ BOOMS
- ✓ BREAKERS
- ✓ CAR DUMPS
- ✓ CASTINGS
- ✓ COAL CLEANERS
- ✓ CONVEYERS
- ✓ CRUSHERS
- ✓ DRYERS
- ✓ FEEDERS
- ✓ GEARS
- ✓ MACHINING
- ✓ PICKING TABLES
- ✓ PULLEYS
- ✓ SCREENS
- ✓ SPROCKETS
- ✓ TRANSMISSIONS
- ✓ VALVES

Gentlemen:

☐ **We need complete information on a complete new plant that:**

will wash_____inches by 0 at_____tons per hour and

dry_____inches by 0 at_____tons per hour.

We want information on the following special equipment:

Name_____Title_____

Company_____

City and State_____

☐ **Have Sales Engineer call for further consultation.** c

McNALLY PITTSBURG

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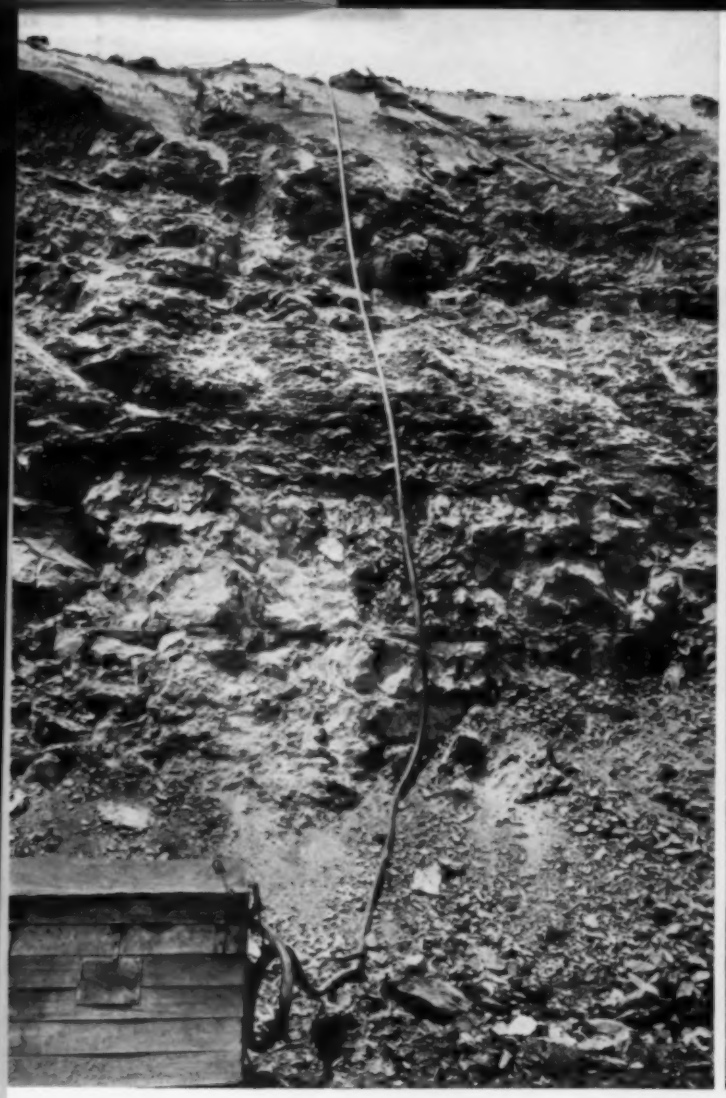


SPECIALLY DESIGNED for rugged conditions like this, Anaconda butyl-insulated Mine Power Cable delivers maximum service and safety.

OPEN PIT OR UNDERGROUND, Anaconda butyl-insulated Mine Power Cable offers exceptional mine water- and abrasion-resistance.

FOR YOUR PROTECTION—

We proved this power cable in our mines

Being miners ourselves, we know mining problems. As both miner and cable manufacturer we're able to do something about them—by *designing* cable to meet problems only miners can know . . . by testing this cable in *our own mines* under actual field conditions.

FOR MINE POWER CABLE

Our firsthand mine experience has helped us build a sturdy cable that cuts down-time. Butyl insulation gives this cable long-aging characteristics, improved resistance to moisture, ozone and heat. Neoprene jacket—rugged, tough—has real flexibility, and resists rock-cutting, impact, flame, sun, and corrosive mine water.

Your Anaconda Distributor has full facts and can help you choose the cable best suited to meet your needs. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. 55322

*Trade Mark

ANACONDA®
MINE CABLE

FLAT-TWIN CABLE

Improved stranding, new insulation, new grounding wire, and neoprene jacket make this a superior cable for shuttle cars, continuous miners, loaders, drill trucks, cutters.

POWER CABLES

Anaconda Types W & G are rugged, sturdy and long-lived. Used for mine power, shovels, continuous miners, loaders, drill trucks, cutters.

SHOVEL AND DRILL CABLES

Securityflex* Types W and G are used with small shovels, self-propelled drill trucks, pumps and a-c mining equipment. For higher voltages, Type SH cables (shielded) are recommended.

SECURITYFLEX CORDS

Unexcelled for strength, wear resistance and long life. Type SO cords (heavy-duty) provide superior service on remote control and hand drills.

TROLLEY WIRE

FEEDER CABLE BARE OR INSULATED

TELEPHONE WIRE

SHOT-FIRE CORD

WELDING CABLE

Maumee Endorses Spencer Product For Akremite Process

Bank-shooter charging drillhole with Akremite, Maumee Mine No. 20.

"We have employed in our experimental work in connection with the development of the AKREMITE Blasting process several grades and types of Commercial Grade Ammonium Nitrate, all of which may be successfully used in the process. Maumee has been using for the past year, or more, the Spencer Chemical Company product which we have found to be well adapted to our own use and in our experimental testing at a large number of shooting jobs on the properties of other mining companies."

HUGH B. LEE, President
Maumee Collieries

The principal material in the manufacture of Akremite is ammonium nitrate. Spencer Chemical Company, one of the world's largest producers, has developed a Commercial Grade Ammonium Nitrate especially for the Akremite Blasting Process. Spencer is prepared to supply your needs.

Please write or phone for further information.

SPENCER CHEMICAL COMPANY

610 Dwight Building • Baltimore 6600

Kansas City, Missouri

FIGHTS WEAR!

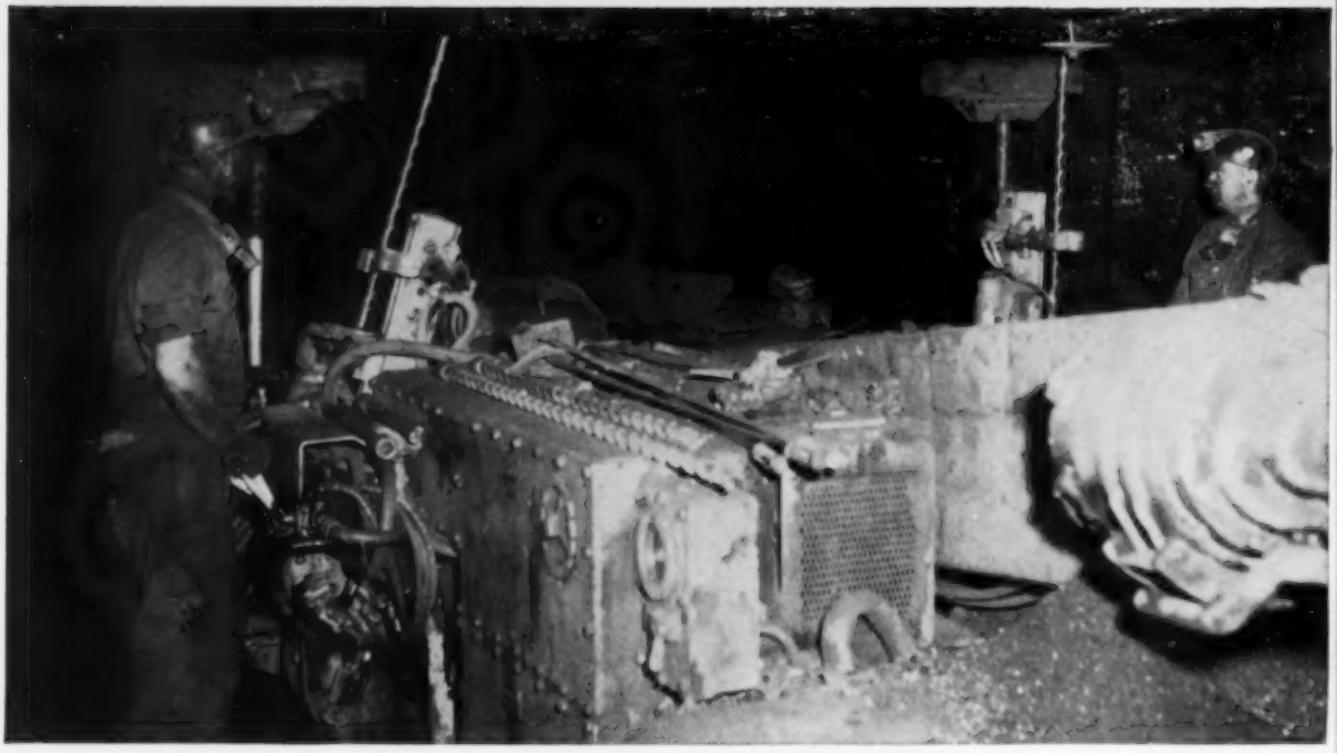
You *can* fight engine wear effectively. Switch to Sinclair TENOL®. This heavy duty oil is fortified with additives that provide additional protection for your engine . . . protection that an ordinary oil can't give.

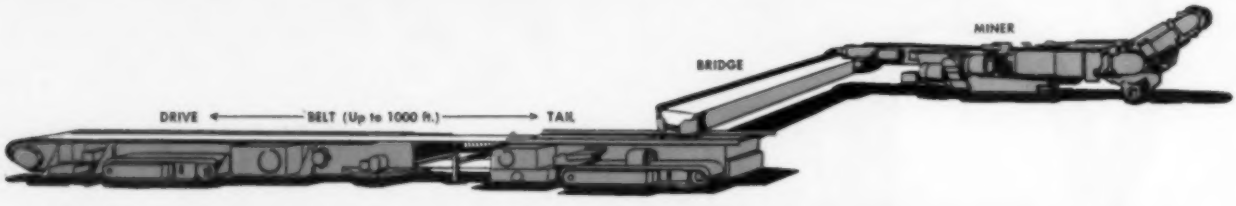
The selected additives in Sinclair TENOL provide detergency, dispersion, anti-oxidation, anti-corrosion and anti-foam characteristics. These qualities protect your engine against wear. They provide high film strength and help insure freedom from ring and valve sticking, carbon and sludge formation, and the corrosive effects of combustion by-products on vital working surfaces.

Get the trouble-free, long-life operation that Sinclair TENOL can give. For the new pamphlet which describes Sinclair Tenol Motor Oils, write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation.*

SINCLAIR TENOL

HERE'S A NEW RECORD! . .





The JOY "1-CM-EX-BELT" COMBINATION

points the way to increase your profit margin

Here's a mining team that can really slash your production costs, as the operating figures on the facing page adequately prove. The Joy 1-CM Continuous Miner, teamed with the Joy Extensible Belt Conveyor for continuous haulage, provides a combination that is the absolute last word in low-cost, high-production mechanized mining in seams of 52" and higher.

For lower coal, the popular 3-JCM Continuous Miner—only 34" high over-all—takes over the extracting job. And for full-face mining in seams of approximately 6 to 8 ft., the powerful Joy Twin Borer is now available for continuous production at an 8-ton-a-minute clip.

The 1-CM Miner has a capacity of 4 tons per minute, is 45" high over-all, and will cut from 5½" below floor to 90" above (120" with special equipment). It is available with two hydraulic roof drills of 4200-lb. thrust (note the photograph above) making the 1-CM a fully integrated unit capable of handling both advance and roof control.

The Joy "Ex-Belt" Conveyor (see drawing above) now permits a continuous mining machine to operate *almost without interruption* in driving rooms and entries up as far as 1000 feet, including breakthroughs and taking pillar on retreat. It is available in 24, 30 and 36-inch widths and consists of two main units: a drive and a tail section with bridge conveyor, both self-propelled on identical crawler treads.

The "Ex-Belt" extends or retracts 50 feet while operating under full load. Belt tension and slippage are under automatic control at all times. A 100-foot length of belt can be added or removed, as needed, in an average time of only 5.3 minutes; and the entire system can be moved over and set up for a new heading in less than 2 hours.

. . . FIRST – TONS PRODUCED PER MAN-SHIFT WENT UP 40%

when a JOY I-CM Continuous Miner was used instead of conventional methods

THEN, increased 69% more

when a JOY Extensible Belt Conveyor was added to provide continuous haulage

	1 MONTH'S RUN I-CM MINER ONLY	1 MONTH'S RUN I-CM MINER-"EX-BELT" COMBINATION
TOTAL PRODUCTION (RAW COAL)	17,818 TONS	21,925 TONS
TOTAL SHIFTS WORKED (TWO ON- ONE OFF)	39	39
AVERAGE PRODUCTION PER SHIFT	457 TONS	562 TONS
BEST PRODUCTION SHIFT	650 TONS	831 TONS
WORKING CREW CHARGED TO THE EQUIPMENT PER SHIFT	8½ MEN	7 MEN
AVERAGE PRODUCTION PER MAN PER SHIFT	53.8 TONS	80.3 TONS

The results above cover two regular periods of operation in a West Virginia mine. The coal is in the Pittsburgh seam and averages about 8 feet in thickness. It contains numerous clay veins up to 4 feet thick, resulting in both bad top and bottom when encountered, and requiring the hauling of considerable waste material. Mining height is limited to about 7 feet, leaving some head coal for roof support, and some bottom because of impurities.

In the first operating period of a month, the Joy 1-CM Miner was teamed with two Joy 10-SC shuttle cars unloading on belt conveyors. Production per man-shift averaged 53.8 tons, *an increase of 40% over conventional mining methods.* Size consist also improved with 1-CM production, with the sizes over ⅜" increasing from 69.1% to 74.7% of the total, on the average.

In the second period, a Joy "Ex-Belt" Conveyor replaced the shuttle cars—*and notice the results!* Again a month's operation was checked. *Production per man-shift jumped to 80.3 tons, an additional increase of 69% and a total increase of 109% over the methods previously used!*

What would results like these do for *your* profit margin? Let us help you to secure real cost reductions under today's conditions, with rugged, field-proved equipment that is built to stay on the job. ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Write for FREE Bulletin 00-00

Consult a Joy Engineer

W&D CL5736-14

JOY

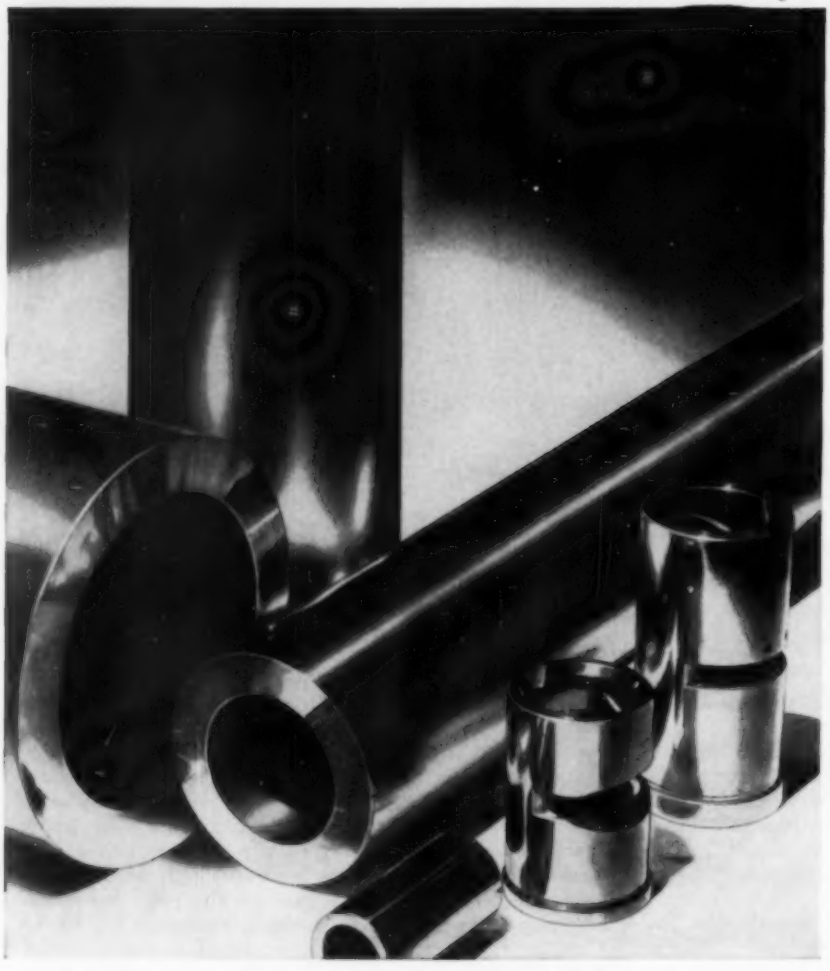
WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

Complete Stocks...Wide Range of Types and Sizes

Bunting® BRONZE

Ready for IMMEDIATE DELIVERY

STANDARD STOCK BEARINGS—There are 845 different sizes of Bunting Standard Stock Bearings. They range in size from 3/16" to 4" bores—5/16" to 4½" outside diameters and ½" to 9¾" lengths. They meet practically every requirement for production and maintenance of machine tools and all kinds of industrial machinery. All are completely machined and finished, *ready to use*—the most economical way to buy!



ELECTRIC MOTOR BEARINGS—Bunting Cast Bronze Electric Motor Bearings are *available* from stock for the popular makes and sizes of electric motors. Dimensionally they duplicate the specifications of the motor manufacturer. Precision made, to very close tolerances, they always fit and are quickly and easily installed.

PRECISION BRONZE BARS—All Tubular and Solid Precision Bronze Bars are cast in permanent metal molds and completely machined—all surfaces—I.D.—O.D.—and Ends. Bores range from ½" to 7½"—outside diameters from 1" to 10", and solid bars from ½" to 8". Can be supplied in 6½" or 13" lengths. The size is stamped on every bar from end to end—you can always identify a piece.

As compared with rough cast bars these save you 50% in machining cost and 25% in purchased metal.

BEARINGS, Inc., 3634 Euclid Ave., Cleveland 15, Ohio

Gentlemen:
Please see that I receive the latest Bunting catalog.

NAME_____

FIRM_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

Stripping costs reduced more than 30% with new-type haulers

18-ton LeTourneau-Westinghouse Rear-Dump is loaded with 4 passes of 3½-yd. shovel.

Kleenbirn Collieries had always hired crawlers and scrapers to strip overburden from their coal beds northeast of Lethbridge, Alberta. Looking for a way to lower costs, the Company several years ago bought 3 C Tournapull Rear-Dumps and a 3½-yd. stripping shovel.

In their first full season (April to November), this team accounted for 578,000 yds. of overburden, sandstone and shale. In the first 3 months of the following season, working a shorter day, the units hauled 112,000 bank yards. Per-yard costs were *less than 35% of the cost* of the last year crawlers were used, and 30% less than *any* of the 10 previous years when crawlers were used. These costs include depreciation and interest on the equipment investment.

Haul up 9½ to 12½% grades

To date, the Rear-Dumps have spent about half their time hauling the dirt and shale overburden pictured, the other half hauling shot sandstone and coal. Loads in clay, earth and shale average 12 bank yards . . . in rock, 9 bank yards. Maximum grades vary from 9½ to 12½%. "These 18-ton LeTourneau-Westinghouse Rear-Dumps are ideal for work with a 3½-yd. shovel," says Foreman W. E. Herrick. "They are the best hauling units for our kind of work."

Rear-Dumps build ramps

One of their most important jobs according to Herrick, is building ramps. Constructed of overburden, these connect pit with spoil pile and coal haul roads. They average 50′ wide, 50′ high, and 250′ long. Not only was their construction long and costly with crawlers and scrapers, but necessary compaction could never be achieved. This caused bad sink-holes to develop. "Now," says Herrick, "with a crawler for leveling and Tournapulls for hauling, we build the ramps much faster. Also, we get better compaction and no sink-holes."

A demonstration on *your* work will show you specifically the many ways LeTourneau-Westinghouse Rear-Dumps can cut haul costs. Call us today to arrange time and place.

Kleenbirn Collieries has been mining coal here since 1919. Seam now being uncovered is 4½ ft. thick. Overburden, mostly shale and clay, is 30 ft. thick. When winter stops mining, LeTourneau-Westinghouse units haul stockpiled coal to bunkers 1½ miles from pit. From here, coal is hauled by truck to nearby towns.

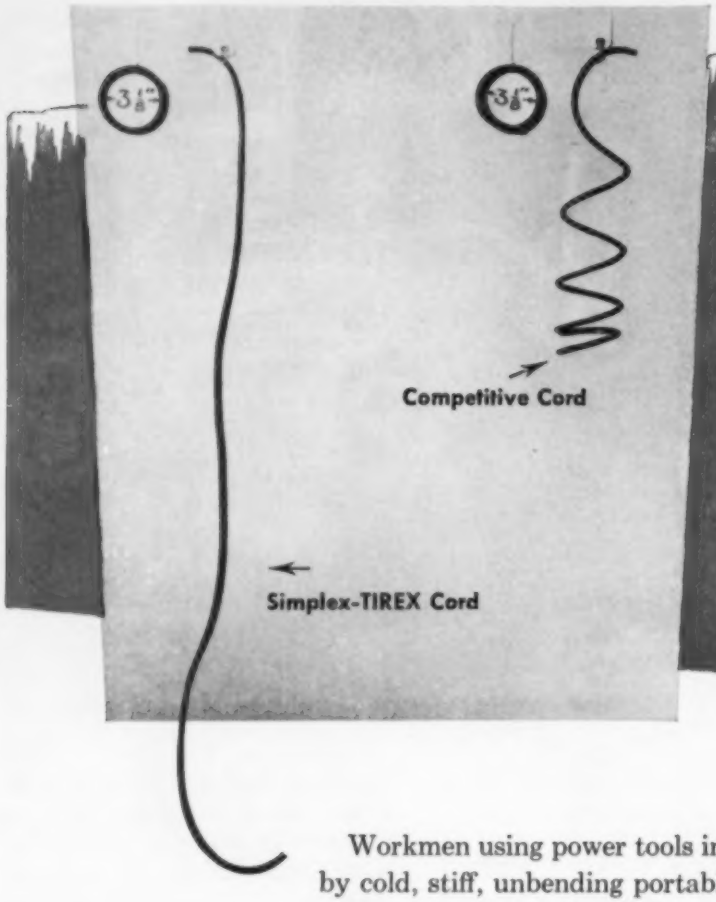
Front-wheel drive, big air brakes, plus the rear dumping action, make it easy for operator to dump entire load cleanly and safely over edge of soft spoil bank.

Tournapull—Trademark Reg. U.S. Pat. Off. R-565-M-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company



"Deep Freeze" tests prove Simplex-TIREX Cords stay more pliable when cold!

Workmen using power tools in winter weather find their work hampered by cold, stiff, unbending portable cords.

Recent tests show that Simplex-TIREX Cords are three times more pliable than other cords when cold.

Here is what we mean.

Two 5-foot lengths of 2-conductor No. 18 SJO cord were wrapped around a 3⅛-inch steel mandrel. One cord was TIREX and the other was a competitor's.

Both samples were locked up in a refrigerator for one month at 36°F.

They were attached to the panel while still in the walk-in refrigerator. The panel was carried outside and immediately photographed. Notice the results. TIREX, on the left, is limp and pliable. The other cord looks like a coiled spring.

Which would you want on your portable tools? You can get genuine TIREX from your electrical distributor.

Simplex

TIREX

SIMPLEX WIRE & CABLE CO.

79 Sidney Street, Cambridge 39, Massachusetts

Clean-up takes only a few minutes per shovel because of Tournatractor's 19 mph forward and 8 mph reverse speeds. In addition to saving time, speedy tractor-on-rubber keeps loading sites and haul roads cleaner because it can get around to each shovel more times per day than a crawler-tractor.

Kaiser Steel Corp.

speeds mine clean-up with Tournatractor

1 rubber-tired rig replaces 2 crawler-tractors

Working their Eagle Mountain Iron Mine, Eagle Mountain, California, Kaiser Steel Corp. find they get more clean-up work done faster with 1 Model C Tournatractor than if they assigned 2 crawler-tractors to handle the same job. The new tractor-on-rubber replaced one full-time crawler, and does the part-time plant and pit maintenance work formerly assigned to a second track-type machine. The change to the faster, more maneuverable 208 hp Tournatractor enables the mine to keep haul units moving with less delays due to spillage or uneven pit floors.

3 to 4 times faster than crawlers

Tournatractor handles all clean-up assignments around 3 shovels. It shuttles back and forth at speeds up to 19 mph, which is 3 to 4 times faster than the top speed of any crawler. In addition, reverse speeds to 8 mph allow unit to back away quickly without interfering with loading operations. Big 21.00 x 25 low-pressure tires provide plenty of flotation and traction. They stand up well despite abrasive and rocky footing around pit floor.

Also used for pulling and pushing

In addition to clean-up and bulldozing, the 208 hp tractor pulls air compressors to drilling sites and moves the frame supports which carry electric cable for shovels, drills, and other equipment.

Get all the facts

Mine owners around the world are taking advantage of the ease of maintenance, durability, speed, and high production of the Tournatractor. If you are interested in these same benefits for your mine, get all the details from your Distributor today.

Tournatractor—Trademark Reg. U.S. Pat. Off.T-828-M-b

Tournatractor also cuts downtime for air compressors and other equipment when moving them from one location to another. Tournatractor gets on the job quicker . . . gets to the next assignment quicker. 1500 ft. is less than a minute away.

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Diagram showing magnetic field for 2-coil, 36-in.-dia., 42-in.-wide pulley. Note how magnetic field blankets entire load.

New magnetic pulley stops tramp iron riding the load peaks

This new Stearns 2-coil electro-magnetic pulley effectively removes tramp iron riding the crest of a conveyor load as well as the pieces that pass close to the magnet's face. Two-coil design produces a powerful magnetic field that is deepest at the center of the conveyor belt where load is heaviest. Thus, the area of magnetic attraction is the same general shape as the load on a conveyor operating under standard conveyor practices.

Smaller, lower-cost pulleys now practical

Because of the nature of the magnetic field, smaller pulleys costing less can now be used on jobs where larger units were formerly needed. An examination of data on a number of proposed installations showed that, in the majority of cases, the recommended new 2-coil pulley was of smaller diameter than a 3-coil pulley of comparable ability.

New, simple pulley selection method*

Because this pulley fits right into recommended conveyor standards for speed of belt travel and depth of load for various types of materials, it is far simpler to select the right pulley than ever before. Stearns provides new selection tables in Bulletin 303-C that now make it possible for you to select the right size unit for your job even before you consult our sales engineers.

Get all the facts on this new magnetic pulley. Find out how it simplifies pulley selection. Write for Bulletin 303-C.

1133

MAGNETIC EQUIPMENT FOR ALL INDUSTRY

STEARNS MAGNETS

STEARNS MAGNETIC, INC., 661 S. 28th St., Milwaukee 46, Wisconsin

Bucyrus-Erie 950-B stripper removes overburden from Traux-Traer Coal Company seam in Fulton County, Illinois. Operation is one of the largest open pit mines in Fulton County, Illinois' second biggest coal producing county. CALUMET Viscous provides lubricant shield for roller swing gear.

Bob Wright, Standard's lubrication specialist, mounts steps to inspect roller swing gear lubricated with CALUMET Viscous. On-the-spot technical help such as this is one of the services Bob performs for his customers. Bob's training includes a B.S. in engineering from Michigan College of Mining, and Bob has completed the Standard Sales Engineering School. Customers find such training pays off for them.

Stripper rides on CALUMET *Viscous Lubricant*

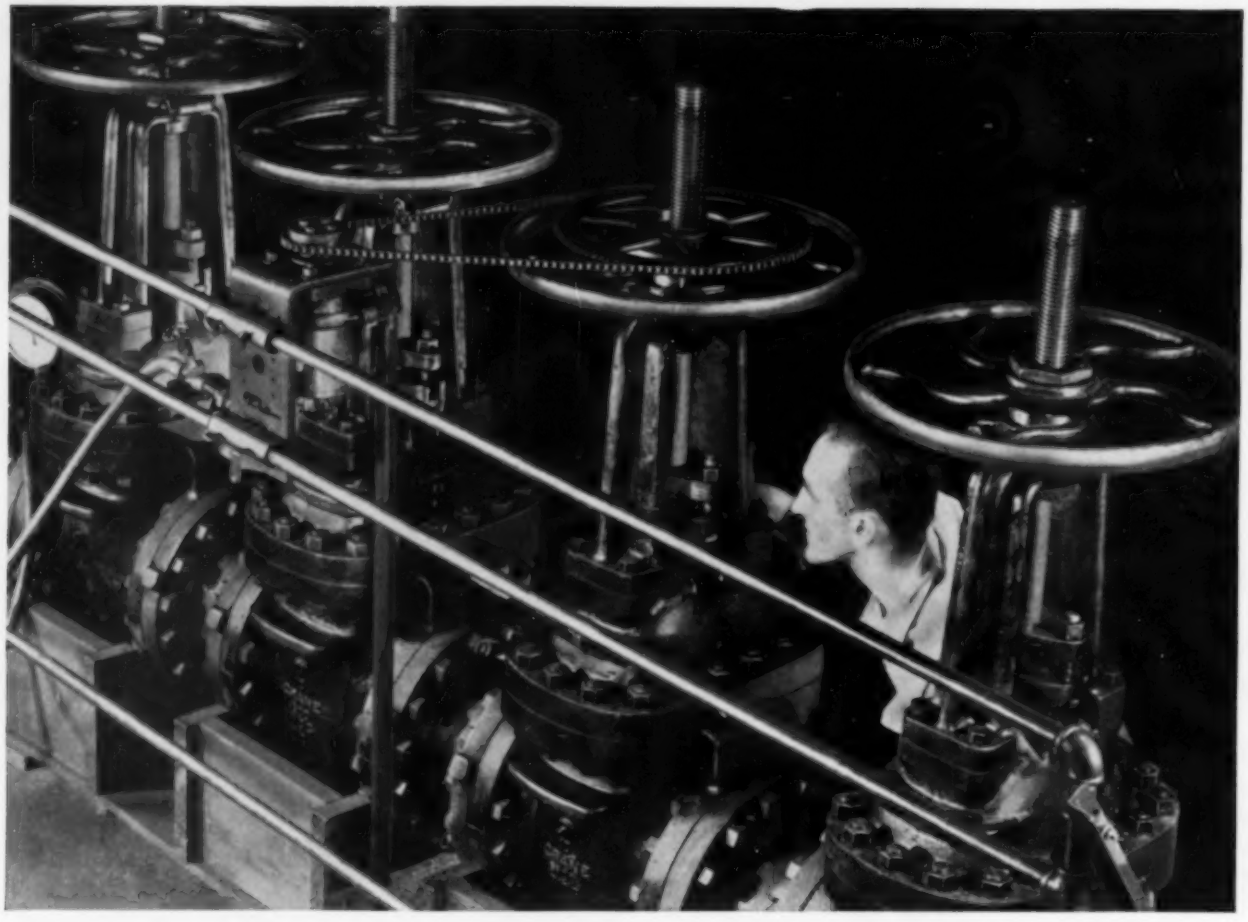
CALUMET Viscous Lubricant has been assigned the job of protecting circle rail rollers and swing gears on a 950-B Bucyrus-Erie stripper at Traux-Traer Coal Company's mine in Fulton County, Illinois. It's been doing this job—and doing it well—for many years. It has had to, for delivering top performance is expected of both lubricants and equipment at this mine. The production goal is a stiff 1,000 tons of coal an hour.

The stripper operates continuously in all kinds of weather—hot, cold, wet, dry, dusty. Selection of CALUMET Viscous Lubricant for this job was a logical decision. CALUMET Viscous is designed to perform under just such conditions. Its adhesive qualities make it stick to gear surfaces and form a near perfect gear shield. It doesn't sling off during warm weather or chip off in cold weather. It can be applied easily and evenly when sprayed or swabbed, does not require preheating.

CALUMET Viscous is one of a large number of lubricating greases in the Standard line. In the Midwest, a lubrication specialist from your nearby Standard Oil office will be happy to tell you about them. Call him today, or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY (Indiana)



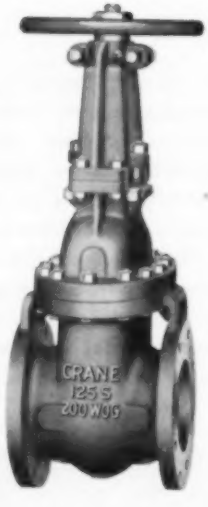
Testing...testing...50 years and longer to make CRANE VALVES maintenance free

Testing for product performance values is an old custom with Crane. It was started long before many standards existed—long before others in the field used this means of product improvement and quality control.

Today's Crane valve testing is done in both field and laboratory by the most scientific techniques. This continuing work seeks to increase valve performance and lessen maintenance needs. A single example is the stem packing test shown above.

Here's one of the reasons back of the thrifty buyers' preference for Crane valves. They can rely on ever-improving Crane quality to protect their company's investments in piping equipment—especially today, in the face of high maintenance and repair costs. No wonder industry keeps using more Crane valves than any other make.

Better Quality
Bigger Selection
in Valves
for Every Need



CRANE CO.

General Offices: 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

CRANE'S FIRST CENTURY . . . 1855-1955

Gouges 42" hole through 190' of coal

with TIMKEN® bearings taking the load

THIS McCarthy coal recovery drill bites its way through 190 feet of tough coal. The power needed to cut through the coal is supplied to the auger by a rugged gear drive.

The loads on these gears are heavy and complex—so Salem Tool Company, manufacturers of the McCarthy coal recovery drill, mounts all gear shafts on Timken® tapered roller bearings.

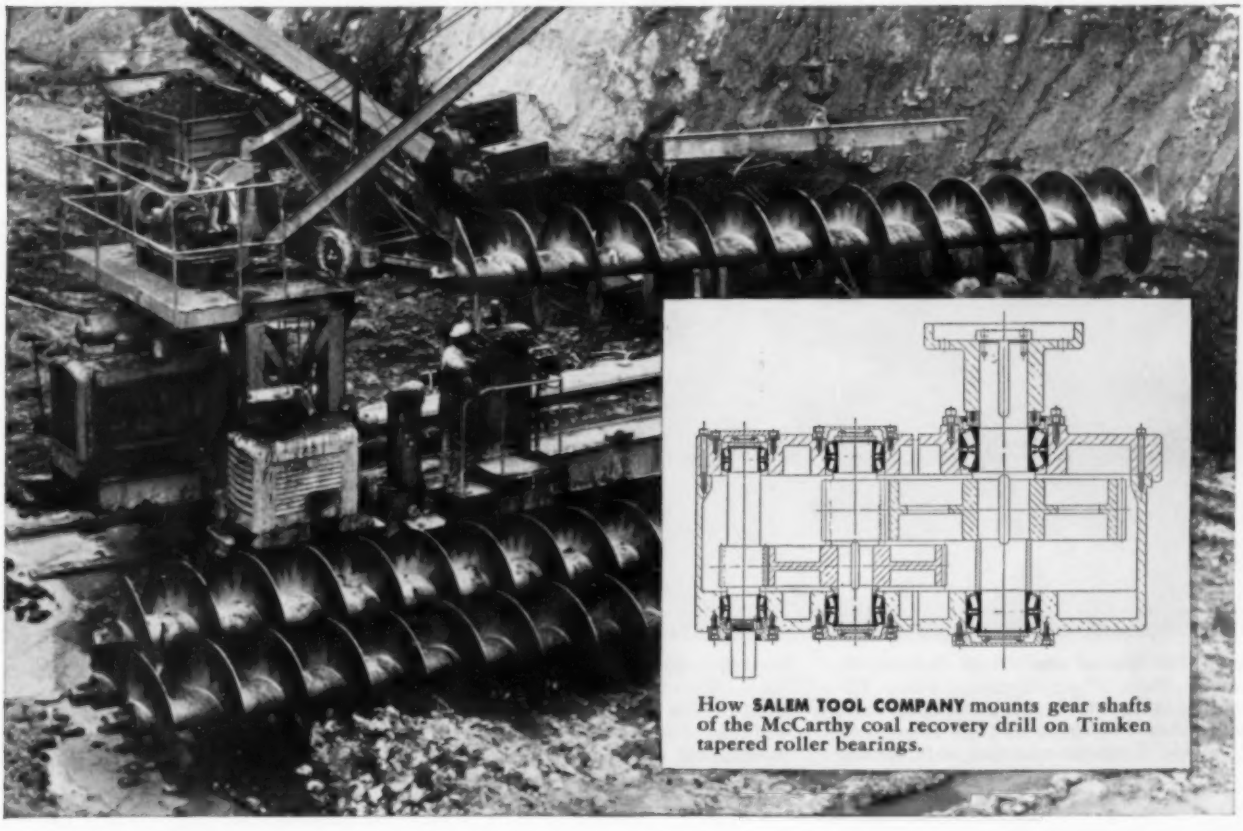
Timken bearings can take the heavy loads because line contact between their rollers and races provides extra load-carrying capacity.

The bevel gears in the drive exert both a radial and a *thrust* load. But, the tapered design of Timken bearings enables them to take both radial and thrust loads in any combination. No extra thrust devices are required. Despite the heavy, grinding loads on these gears, Timken bearings keep them in accurate alignment. This helps insure long life and trouble-free performance.

Dirt and dust can be a big problem in applications like this. But Timken bearings are built to close tolerances; they keep the gear shafts concentric with their housings making bearing closures more effective. Lubricant stays in; dirt, dust and moisture stay out.

When you buy or build equipment, always look for the trade-mark "Timken" on the bearings. It's a sure sign of quality. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **SALEM TOOL COMPANY** mounts gear shafts of the McCarthy coal recovery drill on Timken tapered roller bearings.

WE MAKE OUR OWN STEEL

The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ▯ AND THRUST →▯← LOADS OR ANY COMBINATION

A PICTURE REPORT OF

INTERNATIONAL POWER *in action!*

Boosting job production everywhere

"1/3 more overburden daily than competitive crawlers" . . . that's the report from Merkli Brothers Coal Company, Beaver, West Virginia, on their TD-24. Unit is stripping 40 ft. of sandstone and shale to uncover a 12 to 51-inch coal seam. "It has better balance and visibility than other tractors," says Partner Henry L. Merkli. "It costs less to maintain; takes less time to grease, too."

Strips for barite ore—Near Cartersville, Georgia, Paga Mining Company's two TD-24's average a 4,000 ft. stripping cycle every 10 minutes. This includes time to self-load 15 cu. yds. Units are removing 50 ft. of overburden to reach a 15 ft. seam of 9 to 30% barite. They move 2,000 to 2,500 cu. yds. of spoil per 10-hour day. The plant produces 400 tons of barite in the same time, for use in chemical, paint, and oil industries.

Crushes gypsum—Near Avenal, Calif. Superior Gypsum Company's International-powered crusher produces 300 tons of gypsum per 8-hr. day. Material is used to neutralize high-alkali irrigation water.

1 more trip hourly—Fast loading and acceleration help 18½-yd. Payscraper make one more trip hourly than other self-propelled scrapers used by W. E. O'Neill Construction Company, Gary, Indiana. Cycle length averaged 2½ miles; material was mostly sand. For hauling ore, scraper interchanges with bottom-dump wagons.

Tows 1500-lb. loads and often 4500 lbs. Utility of IH wheel tractors is now unsurpassed. This unit tows castings for a plant near Longview, Texas . . . others do loader, fork-lift, similar tasks.

No repairs in 2 years of continuous crusher service—that's the record of the International 125 hp diesel shown above. Average output, in gravel pit near Bartlett, N. H., is 100 cu. yds. hourly.

Rugged in rugged rock—"TD-6 is ideal for opening underground mines," says M. McDonald, Kiabob Uranium Corp, Green River, Utah. "It gets around fast in narrow tunnels, yet brings out BIG loads."

International Industrial Power

INTERNATIONAL HARVESTER

A machine size for every job . . . see your nearest INTERNATIONAL DISTRIBUTOR for details.

PAYSCRAPERS
12 yds. and 18½ yds.

WHEEL TRACTORS
9 Models . . . . 9 to 59 dbp

CRAWLER TRACTORS
6 Models . . . . 40 to 200 hp

DIESEL, GAS ENGINES
18 Models . . . 16½ to 200 hp

ALSO: International Draft Loaders . . . International Scrapers, Bottom-Dump Wagons . . . and International Superior Pipe-Boom Tractors.

IN THE ALIQUIPPA WORKS OF JONES & LAUGHLIN STEEL CORP.

Unloader Operation Is Controlled By One Man

The giant coal barge unloader handles J&L's Aliquippa Works normal daily requirements of 10,500 tons of coal.

As the loaded barge is moved slowly under the unloader, coal is hoisted by a continuous elevator comprised of two lines of 7′ wide, ½ ton capacity buckets. These buckets carry the coal to a hopper at top of the unloader, from which it is conveyed by a 60″ wide belt to the surge bins.

The unloader removes the coal so completely that clean-up is not needed in the barge at any time.

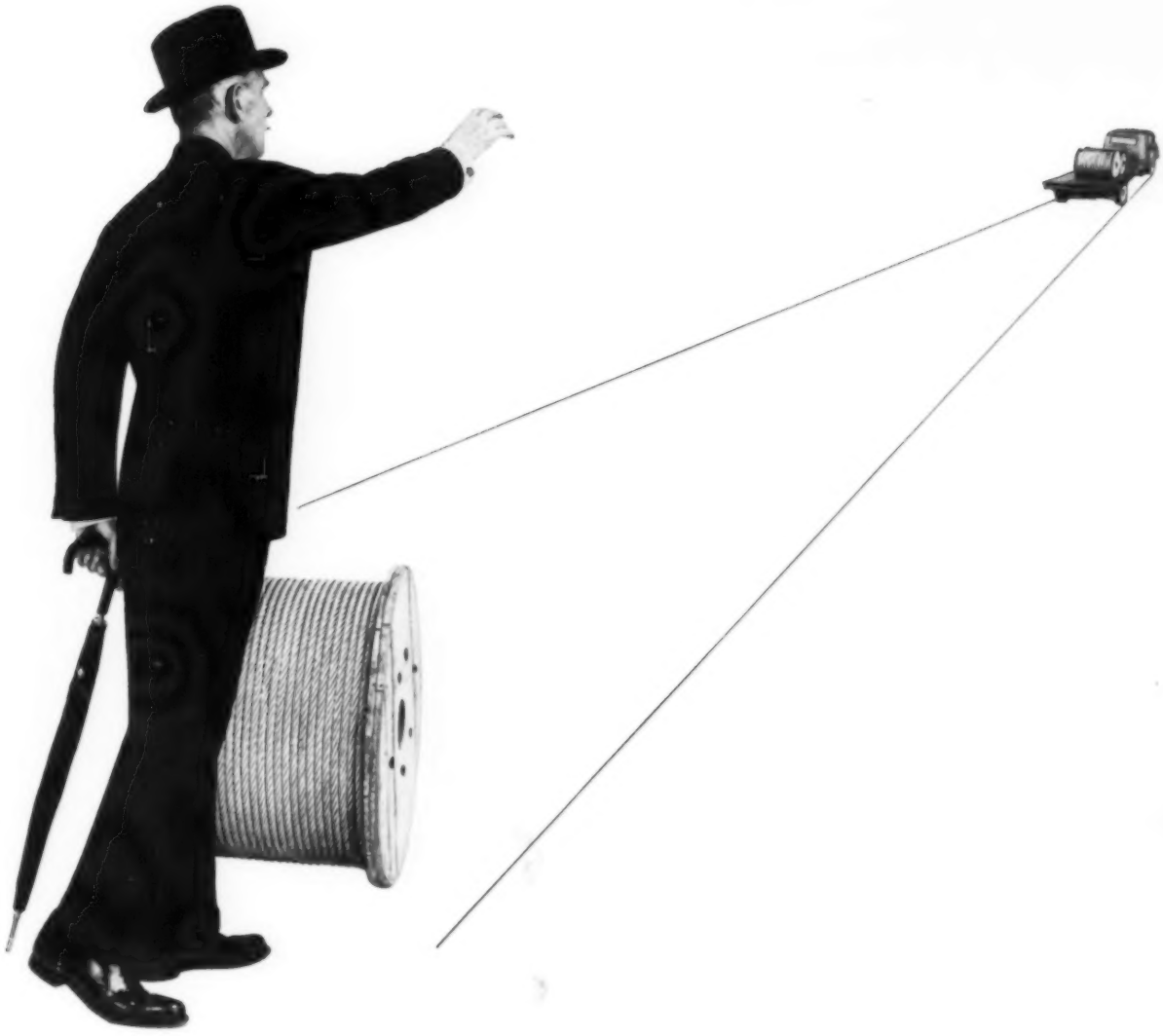
When being unloaded the coal barge is protected from drifting by snubbing lines and barge positioners. The independent movement of the positioners enables the operator to keep the barge in precisely the right position at all times. The positioners are also used to push the barge away from the dock after unloading.

All movements of the barge and bucket elevator unloader are finger-tip controlled by one man. This man, located in a glass enclosed cab, has clear vision of all operations of barge movement and unloading.

Heyl & Patterson is now building a similar Coal Barge Unloader and Handling System of greater capacity for Jones & Laughlin Steel Corporation's Coal Preparation Plant at East Frederickstown, Pa.

Heyl & Patterson
INC.

55 FORT PITT BLVD. • PITTSBURGH 22, PA.
PHONE COurt 1-0750



YOUR WICKWIRE ROPE DISTRIBUTOR SAVES YOU DOWN TIME

When the lack of the proper wire rope halts your production or your operations, thank your lucky stars that your helpful Wickwire distributor is only a quick phone call away. It's a wonderful feeling...to know you'll be getting exactly what you need from his warehouse stocks in only a few hours time.

Now contrast that with the cost in time, money and inconvenience of emergency shipments direct from a distant manufacturer.

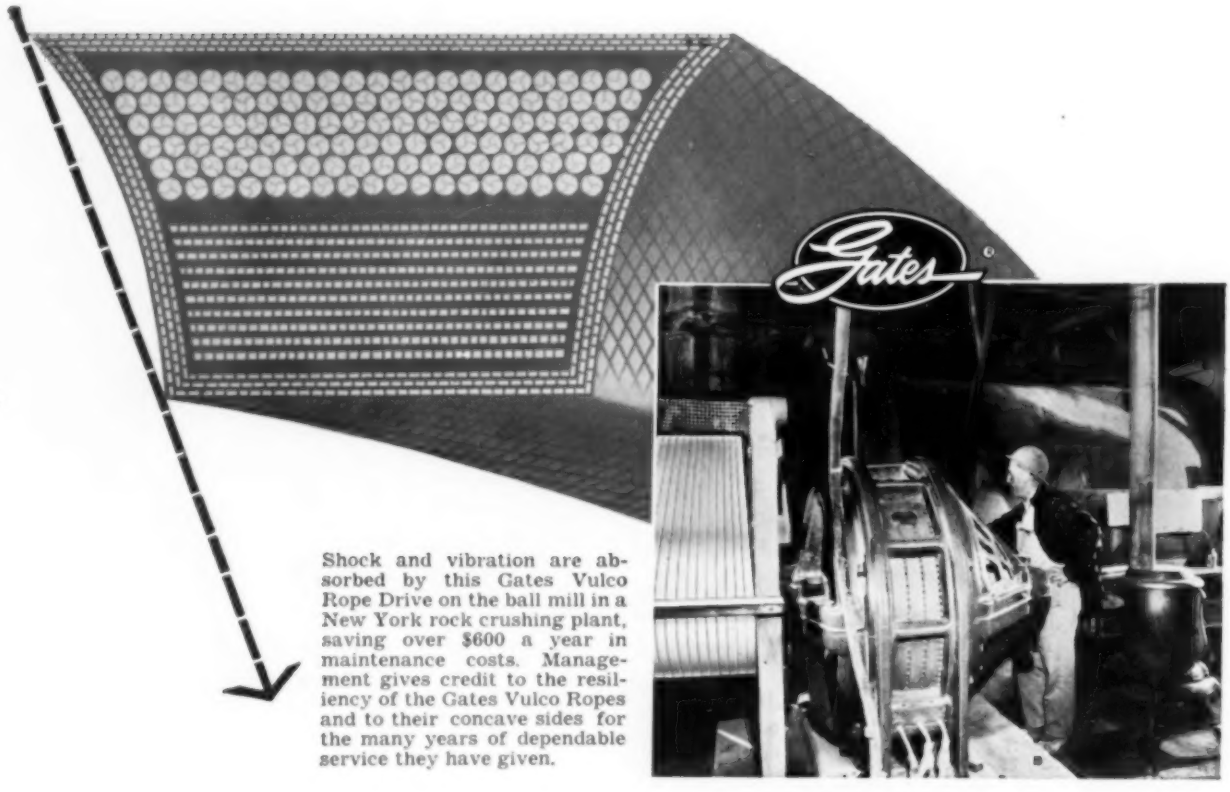
In addition to saving on down time, your Wickwire distributor effects further economies by recommending the wire rope that will give you the longest service life, by minimizing your bookkeeping, inventory maintenance and transportation costs. He keeps your reserve stocks for you so that you don't tie up capital in stand-by materials, warehouse space and unnecessary stock insurance and handling.

Your Wickwire Rope distributor is a good man to know. He's quality people handling quality products. Buy your wire rope and slings from him. You'll find that the many valuable services he offers far outweigh any apparent price advantage you might gain by buying direct.

CF&I WICKWIRE ROPE A CF&I PRODUCT

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

3152



Shock and vibration are absorbed by this Gates Vulco Rope Drive on the ball mill in a New York rock crushing plant, saving over $600 a year in maintenance costs. Management gives credit to the resiliency of the Gates Vulco Ropes and to their concave sides for the many years of dependable service they have given.

Concave sides keep belt costs down!

Industry is saving thousands and thousands of dollars every year by specifying Gates Vulco Ropes—the V-Belts with *concave sides* (U.S. Pat. No. 1813698).

Here's the interesting reason *why* Gates belts save money:

On the bend around the sheave the *precisely engineered* concave sides (Fig. 1) of the Gates belt fill out and become straight (Fig. 1-A). Thus the belt makes uniform contact with the sides of the pulley. That means sure pulling power and *even distribution of wear*. Longer wear, fewer replacements cut belt costs...reduce down time...contribute to profits.

Simple test proves value of concave sides

Bend a straight-sided belt (Fig. 2) and feel the sides *bulge out* around the bend. The bulging sides prevent the belt from fitting evenly in the pulley groove (Fig. 2-A). Uneven contact causes uneven wear...shortens belt life...increases costs.

Keep belt costs *down* by specifying Gates Vulco Rope Drives—the V-Belt with *concave sides*. Belts you need are readily available from nearby distributor stocks. The Gates Rubber Company, Denver, Colorado—*World's Largest Maker of V-Belts.*

Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world...

TPA 25-B

GATES VULCO ROPE DRIVES

Delivery from Stock in every coal mining area...

ROOF BITS

Firthite "Blue Bits" for roof drilling are made in 3 styles: RDL for light uses and very soft roof rocks; RDH with extra heavy duty insert to resist gage wear for most difficult roof drilling; RDS (slotted) for faster drilling of medium to hard roofs. All are water channeled for either wet or dry work.

DRILL BITS

Firthite "Blue Bits" for rotary drilling available in 3 styles:—D with either square or hex shank for use with any standard drilling equipment; DV (illustrated) for faster and easier hand held drilling.

MACHINE BITS

Firthite "Blue Bits" for mining machines include bit design, style and grade for every need from light to rugged condition on continuous mining equipment.

FIRTHITE "BLUE BIT" MINING TOOLS

Increased Distribution in Eastern Kentucky

Greater availability of Firthite "Blue Bits" from field stocks in Bell, Clay, Harlan, Knox, Leslie, Perry and Whitley Counties has now been assured by the appointment of McComb Supply Company, Harlan, Ky., as an authorized Firthite "Blue Bit" distributor. All necessary grades, sizes and styles are stocked for immediate delivery . . . in roof bits, drill bits, machine bits and finger bits.

You can count on these rugged, dependable, proved-in-the-mine tools to reduce mining costs by minimizing down-time, provide maximum tool life and out-perform conventional tools in the toughest applications.

FINGER BITS

Firthite "Blue Bits" for use in standard drill heads feature two-surface brazing with tips set in recesses for greater strength. Available in all popular sizes.

Mr. Tooley says—

"Firthite 'Blue Bits' are better because Firth Sterling makes *both* steels and carbides. Tool steel shanks and Firthite Carbide inserts are perfectly matched by one manufacturing source for maximum quality."

Firth Sterling

—INC—

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

DISTRIBUTED BY:

AUSTIN POWDER COMPANY—Cleveland, Waynesburg, Evansburg, Madisonville
U. S. STEEL SUPPLY COMPANY—Pittsburgh
AMOS A. CULP—Birmingham
CARL B. LEWIS—Scranton
MOLE-BITS COMPANY—Johnstown
McCOMB SUPPLY COMPANY—Harlan

R-309R

PRODUCTS OF FIRTH STERLING METALLURGY

High Speed Steels
Tool & Die Steels
Stainless Specialties
High Temperature Alloys
Sintered Tungsten Carbides
Firth Heavy Metal
Chromium Carbides
High Temperature Cermets
Zirconium

COMPARE ABILITY...COMPARE COST! CHOOSE THE BD-3 MOTOR GRADER

Outstanding Performance On All Types of Jobs The Allis-Chalmers BD-3 is a *quality* motor grader — with such features as tandem drive for maximum traction; exclusive ROLL-AWAY moldboard that efficiently rolls the load instead of pushing it; high axle and throat clearance to clear large windrows; husky tubular steel frame that absorbs stresses and strains. In addition, the BD-3 has the right combination of weight, power and traction to do outstanding work on a wide variety of motor grader jobs.

Economical to Own and Operate. The BD-3's economy begins with its purchase price. You are invited to compare this with the cost of other graders in its class. Compare also what you get for your money. The modern engineering, quality materials and precision workmanship in the BD-3 are your assurance of long-life dependability.

ROLL-AWAY is an Allis-Chalmers trademark

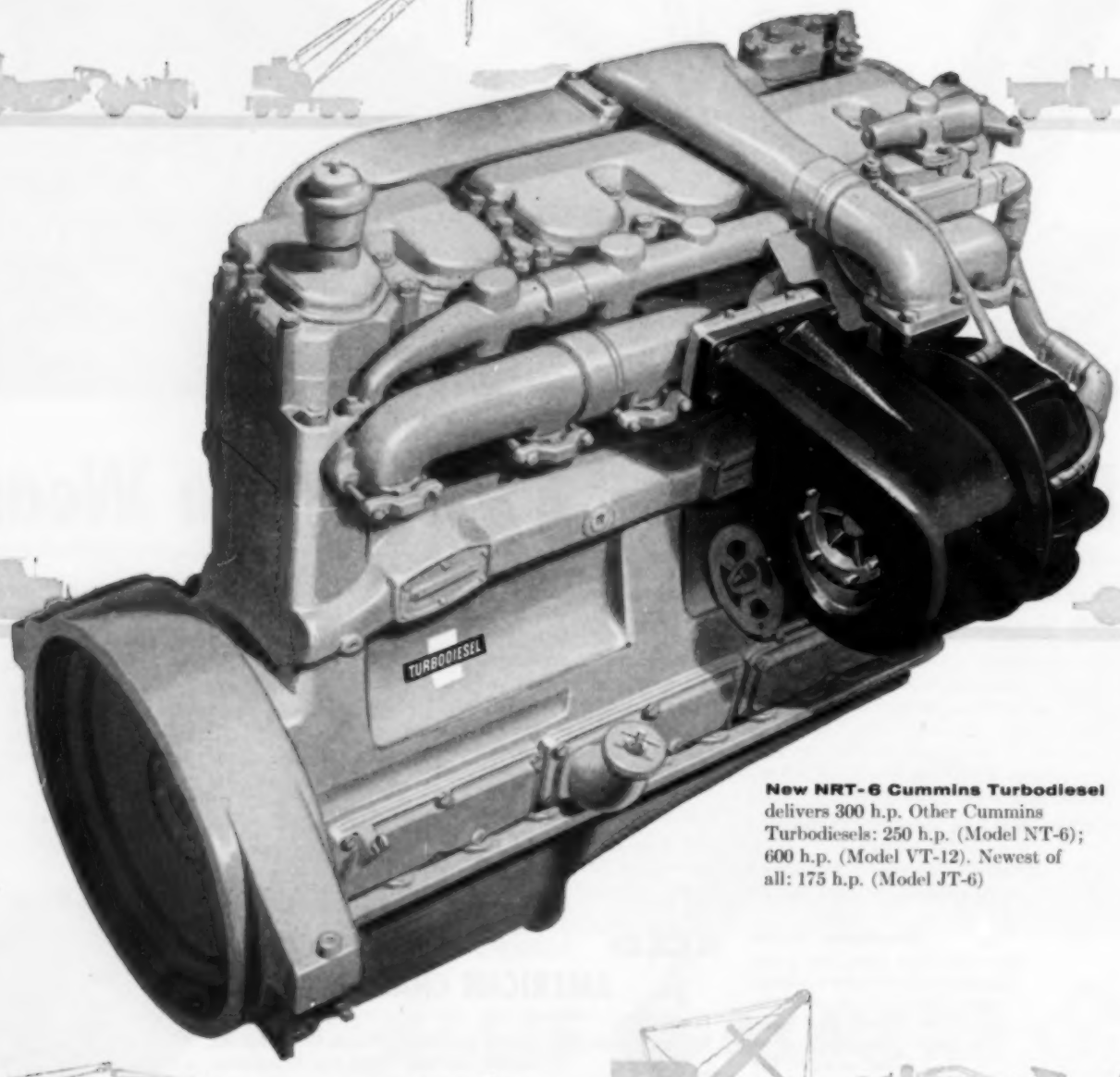
CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

78 brake hp — 19,220 lb
6 forward speeds to 18.5 mph
3 reverse speeds to 6.3 mph

ALLIS-CHALMERS

Now available in all kinds of mining equipment...

NEW CUMMINS



New NRT-6 Cummins Turbodiesel delivers 300 h.p. Other Cummins Turbodiesels: 250 h.p. (Model NT-6); 600 h.p. (Model VT-12). Newest of all: 175 h.p. (Model JT-6)

TURBODIESELS

POWER!.....PERFORMANCE!.....PROFIT!

Here's a new power concept to make *your* mining jobs more profitable. Cummins Turbocharging brings you extra diesel horsepower without added engine weight by harnessing the energy in normally wasted exhaust gases . . . boosting engine efficiency.

Field tests on all kinds of mining and construction jobs show significant savings in time, fuel and equipment. And like all Cummins Diesels, the new Turbodiesels feature the simple to understand and service PT fuel system and easy-as-gasoline maintenance. Added time-saving economy feature: Cummins nationwide distributor system makes sure that factory-type service and genuine Cummins parts are always near *your* operation.

No wonder *more and more mining men are standardizing on Cummins Diesels.*

CUMMINS diesels give you the big plus **MORE PROFIT**

Cummins Engine Company, Inc.
Columbus, Indiana

I am interested in finding out more about the advantages of Cummins Turbodiesels. Please send me:

_____Your directory of manufacturers offering Cummins Diesels in their equipment.

_____Your booklet illustrating Turbodiesel principles.

I am interested in converting my present equipment to Turbodiesel power.

_____Please have your representative call.

Name_____

Position_____

Company_____

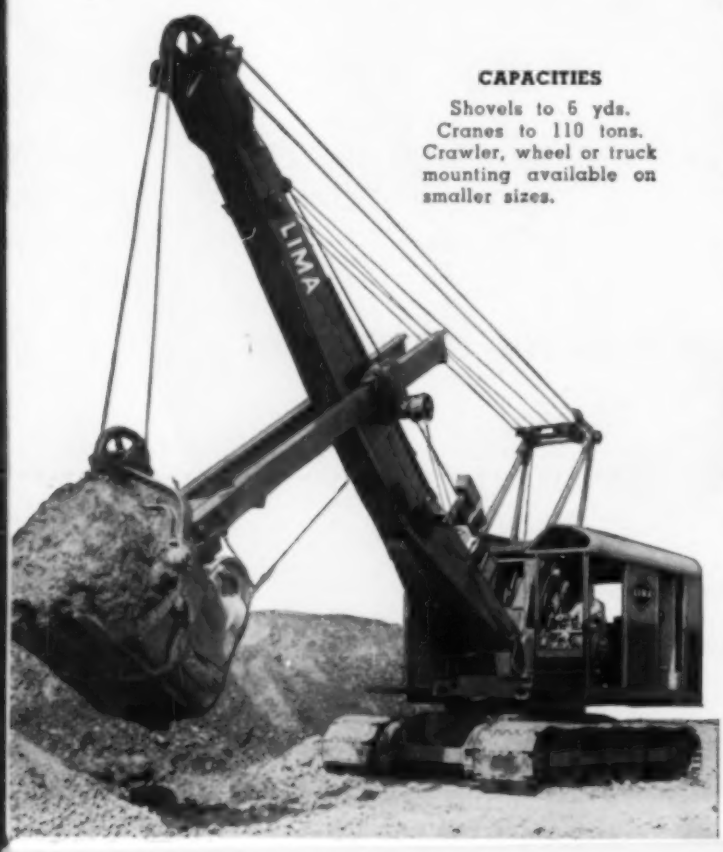
CA-11

City_____ State_____

LIMA'S new Electric Power Unit eliminates stalls, won't burn out

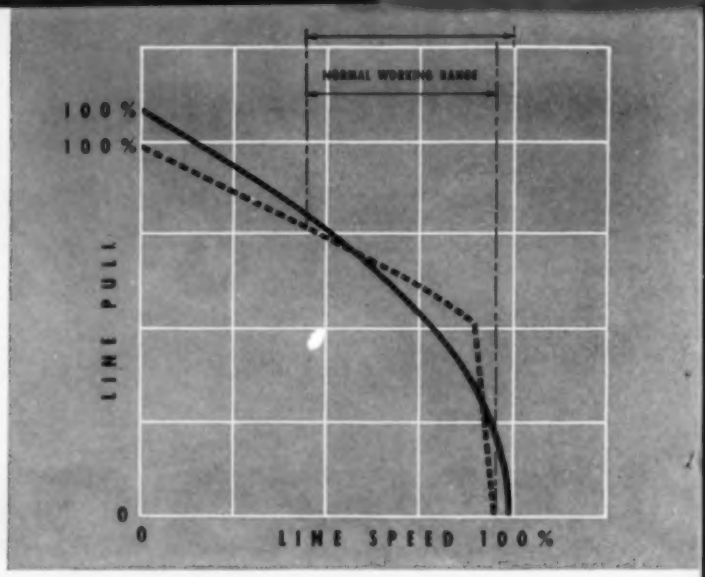
LIMA's new optional power unit matches, *electrically*, diesel-torque converter performance. It combines an AC motor with a single stage torque converter to adapt actual power output to work load demand—at constant motor speed. Thus, you get power on demand through a wide operating range . . . and the motor will not stall or burn out in heavy load operation.

Just check the performance curves —— They make it clear that LIMA's new electric power unit is the perfect answer when your job calls for electrically powered machines. The new unit is available on every LIMA machine. It will pay you to get the full story today from your nearby LIMA distributor . . . or write: Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.



CAPACITIES

Shovels to 6 yds.
Cranes to 110 tons.
Crawler, wheel or truck mounting available on smaller sizes.

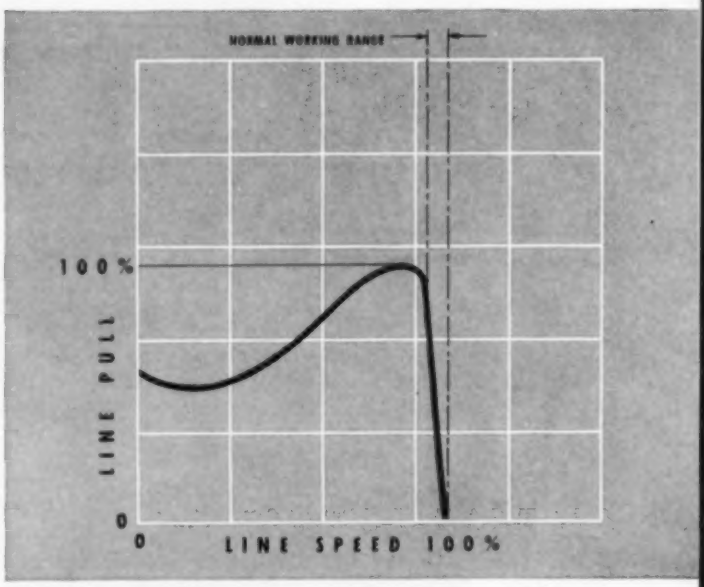


Power Performance of LIMA'S New Optional Unit:

A.C. Electric motor with torque converter drive [Diesel-torque converter curve (dotted line) shown for comparison]

With this drive, even under extreme loading, the motor will pull down in speed only a very small amount. It can never be stalled.

The line pull will constantly increase through a long pull down speed range, depending upon the load applied.



Power Performance: A.C. Electric motor with direct drive

The motor speed and torque varies as shown for line speed and pull.

With a pull down in speed of only 3% to 5%, torque rises too fast. The motor will stall quickly after peak torque is reached. Workable speed range is small, stalls are frequent.

BALDWIN BLH LIMA-HAMILTON

LIMA SHOVELS · CRANES DRAGLINES · PULLSHOVELS

BALDWIN-LIMA-HAMILTON

Construction Equipment Division · LIMA · OHIO · U. S. A.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

no freezin this season

1. **FREEZE PROOF**—Permatreated coal resists freezing and eliminates frozen car pockets
2. **DUST PROOF—ODORLESS**—Permatreated coal insures dustless delivery and handling, odorless storage and burning
3. **DECREASE WATER ABSORPTION**—Permatreated coal repels water and coal unloads twice as fast
4. **REDUCE MOISTURE**—Add 300,000 BTU per ton for each 1% reduction in moisture
5. **AVOID CORROSION**—Non-corrosive Permatreat can't pit or corrode stoker equipment
6. **MAINTAIN QUALITY**—Permatreat reduces deterioration from weathering
7. **ELIMINATE WINDAGE LOSS**—that results in lost weight claims and air pollution complaints
8. **CONTROL BULK DENSITY**—Permatreat insures uniform coke production and quality

Coal treated with . . .

Ashland
PERMATREAT
COAL SPRAY
seals in dust

"lasts the life of the coal"

Interested? Write, wire or phone

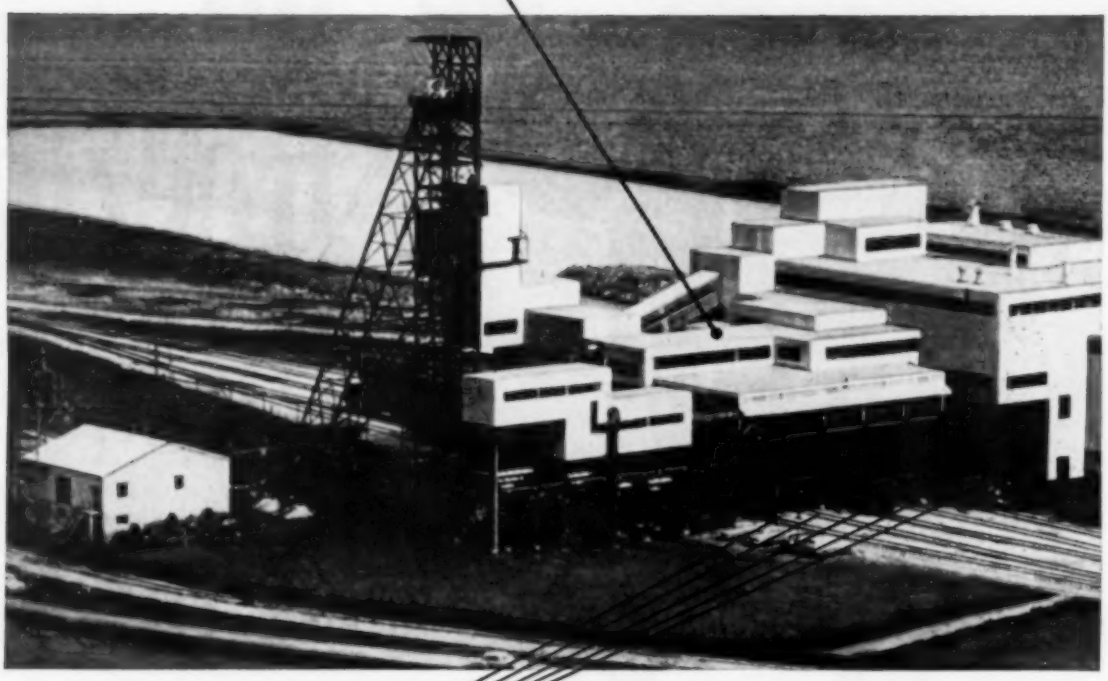
ASHLAND OIL & REFINING COMPANY

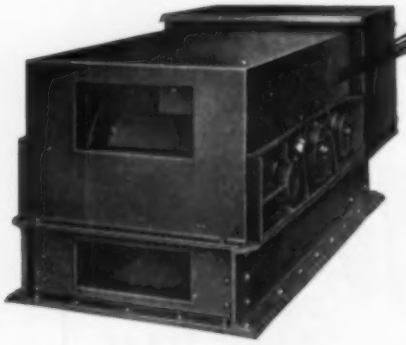
Ashland, Kentucky

Special Advisory Service available from nationally recognized authorities on coal treatment.

Layer Loading is your answer

. . . to more uniformity and better blending of materials



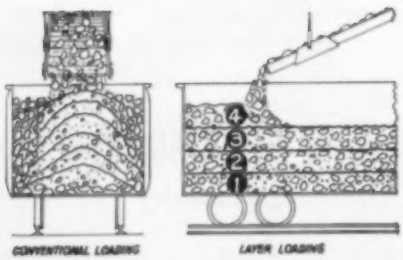


WITH THE PUSH-BUTTON CONTROLLED "BROWNIE" Hoist-Retarder you handle movement of cars in both directions for layer-loading.

One or several cars may be shuttled under the loading point and material loaded in layers with "BROWNIE" Hoist-Retarders. Separation of lumps and fines is reduced. There is less degradation and materials having varying chemical and physical properties may be mixed, insuring greater uniformity of product.

The "BROWNIE" Hoist-Retarder Model HKG has a 15 HP motor and is rated 12,000 lbs. rope pull at a hauling speed of 50 fpm. It can handle three 70-ton cars on a 2% grade. The model HKI is used to distribute materials in five to seven cars. It is driven by a 30 HP motor rated 24,000 lbs. rope pull hauling and 18,000 lbs. lowering at 45 fpm. A smaller model with a 7½ HP motor is also available. Ask us for more information.

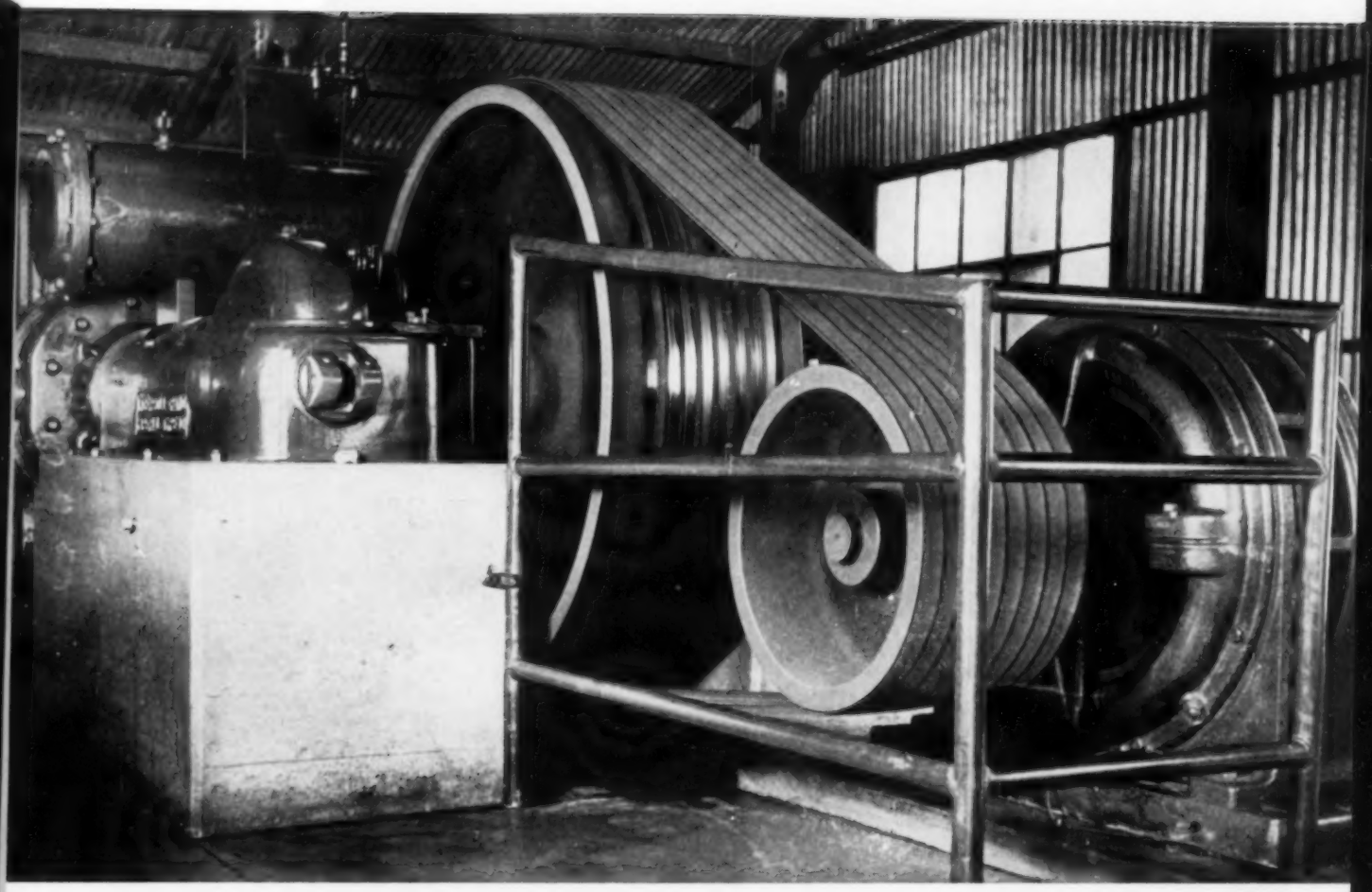
Brown-Fayro Division of SANFORD-DAY IRON WORKS, INC., P. O. Box 1511. . . . Telephone 3-4191, Knoxville, Tenn.



BROWN-FAYRO DIVISION OF

SANFORD-DAY IRON WORKS

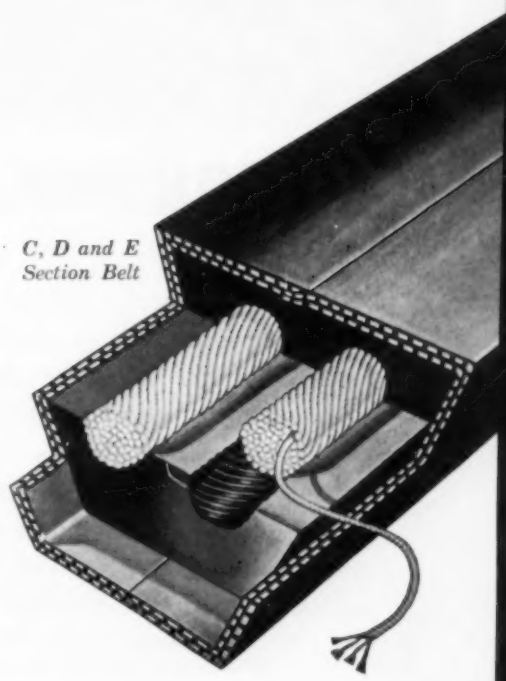
KNOXVILLE • • • TENNESSEE



Thermoid Multi-V Belts cut operating costs

There's a Thermoid V-Belt for every mining application. Every belt is *pre-stretched* to provide longer service and maximum power transmission without slippage. Thermoid C, D and E sections are rayon-grommeted for brute strength and extra flexibility that withstands repeated shock loads. The entire belt is vulcanized into a solid unit that resists moisture, abrasion, internal friction and heat.

Get longer wear with less maintenance . . . cut your operating costs with Thermoid Multi-V Belts. To meet the exacting requirements of mining service, your Thermoid Distributor carries a complete line of Thermoid Multi-V Belts, Hose and Conveyor Belting. Call him or write direct for complete information.



C, D and E Section Belt

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

FOR ECONOMICAL, BIG-VOLUME STRIPPING

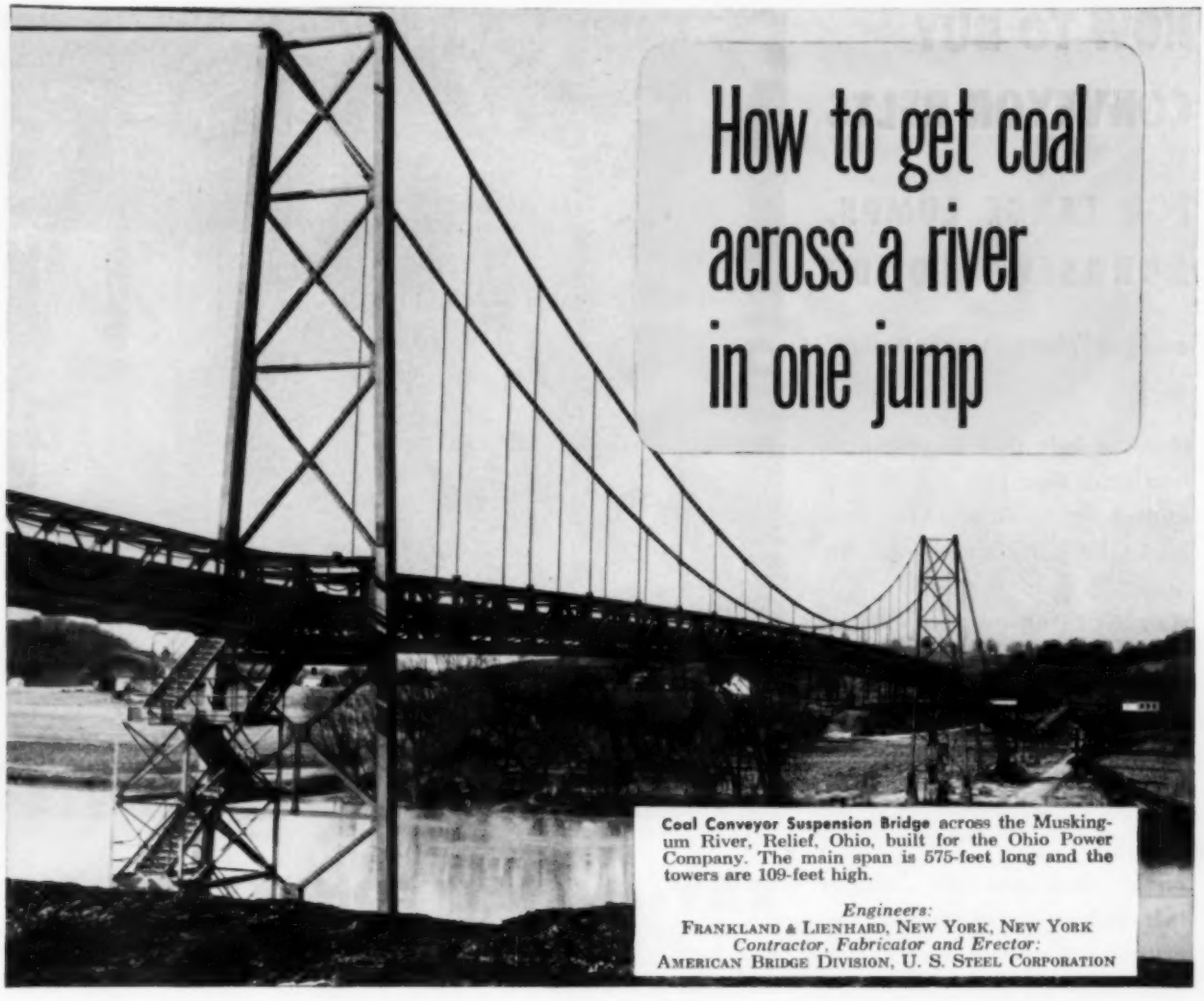
Nothing creates preference like dependable, profitable performance . . . and it is just this kind of performance that has made Bucyrus-Erie walking draglines preferred the world over.

The outstanding performance of these machines comes from front-end design that combines great strength with light weight, exclusive walking mechanism that makes move-ups smooth and accurate, simple main machinery with a minimum of moving parts, responsive Ward Leonard variable-voltage control, long operating range, large output capacity — features that have helped build customer preference for years.

Find out how stripping ability like this can help you on your operations. 60L35

BUCYRUS ERIE
South Milwaukee
Wisconsin

1880 75 1955
YEARS OF SERVICE
to Men Who
Shape the Earth



How to get coal across a river in one jump

Coal Conveyor Suspension Bridge across the Muskingum River, Relief, Ohio, built for the Ohio Power Company. The main span is 575-feet long and the towers are 109-feet high.

Engineers:
FRANKLAND & LIENHARD, NEW YORK, NEW YORK
Contractor, Fabricator and Erector:
AMERICAN BRIDGE DIVISION, U. S. STEEL CORPORATION

Conveyor Suspension Bridge, built with Tiger Brand Prestressed Bridge Strand, does the trick.

Moving coal across a river is costly—especially if you have to handle it two or three times. The Ohio Power Company solved this problem with a coal conveyor suspension bridge. Coal now flows across the river, economically, in a steady stream. There's no extra handling.

The bridge is suspended from two main cables, each composed of four 2" diameter Tiger Brand prestressed, galvanized strands. There are 44 vertical suspenders of 7/8" prestressed, galvanized bridge rope.

Prestressing the strands to one-half their designed breaking strength for several hours is a thorough test of quality of the material. It also produces a cable strand that will not stretch over the years due to use.

American Steel and Wire Division has the engineering experience and complete manufacturing facilities to produce the finest bridge strand and wire rope you can buy. Call or write for further information or contact our nearest distributor. He's listed in the classified directory under "Wire Rope."

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

HOW TO BUY CONVEYOR BELTS

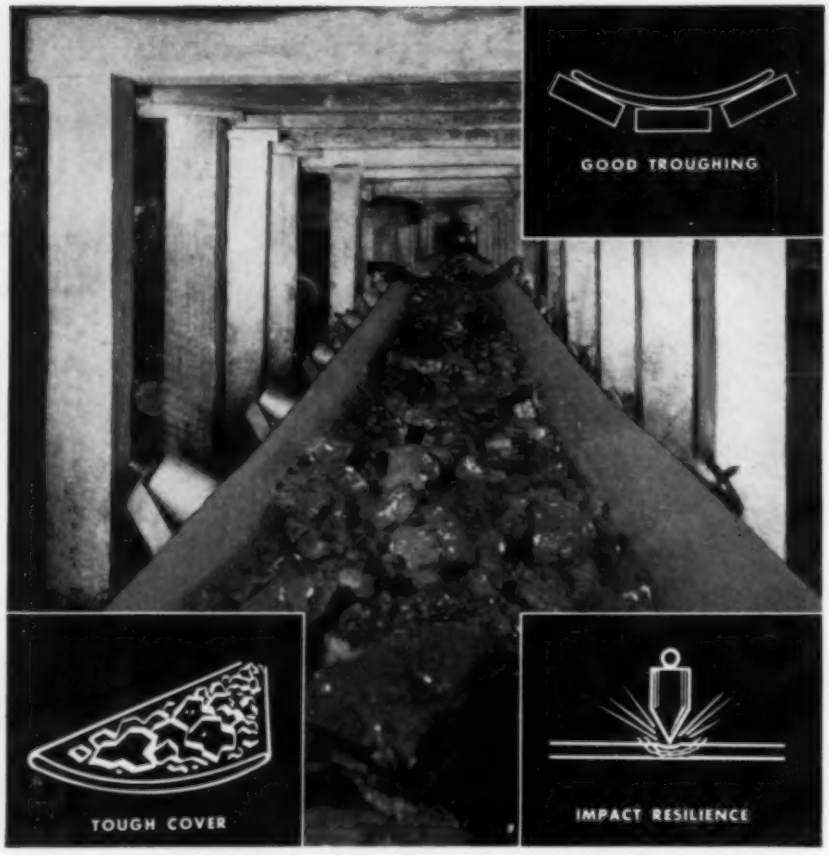
FOR LARGE LUMPS, ABRASIVE LOADS

and get "More Use per Dollar"

Select a belt that assures both maximum flexibility *and* loading impact resistance. One that has high draw-bar strength plus the ability to hold fasteners, and a cover that truly protects and prolongs belt life.

Heavy conventional duck belt constructions fail to provide the needed flexibility and resiliency to absorb heavy loads. They are stiff and "boardy", hard to train on the idlers. Look for a conveyor belt with strength members specially woven to trough easily and cushioned to withstand shock loading. Make certain the belt is moisture and mildew-proof, with protective outer plies and sufficient cover thickness to resist wear and prolong belt life.

Specify by name, the one conveyor belt that offers all these features . . . Ray-Man "F" Conveyor Belt.



RAY-MAN "F" CONVEYOR BELT

This Manhattan conveyor belt combines elastic cushioned inner plies in an outer envelope of strong, yet flexible, synthetic fabric . . . to withstand large, abrasive lumps . . . to permit easy troughability, even where only a thick, narrow belt is used. Special synthetic outer-plies provide maximum elasticity for rounding small pulleys in confined areas. Ray-Man "F" is mildew-proof and, like all Manhattan heavy duty conveyor belts, its service life is greatly prolonged by R/M's exclusive "XDC" Cover which protects it against abrasion, cuts and tears. For unusually abusive shock loading problems you may find extra-cushioned Homocord your best conveyor belt buy . . . or Ray-Man Tension-Master for extra long lifts.

Let an R/M representative help you select the best conveyor belt to meet your job requirement . . . you'll get "More Use per Dollar".

RM-500 UGC

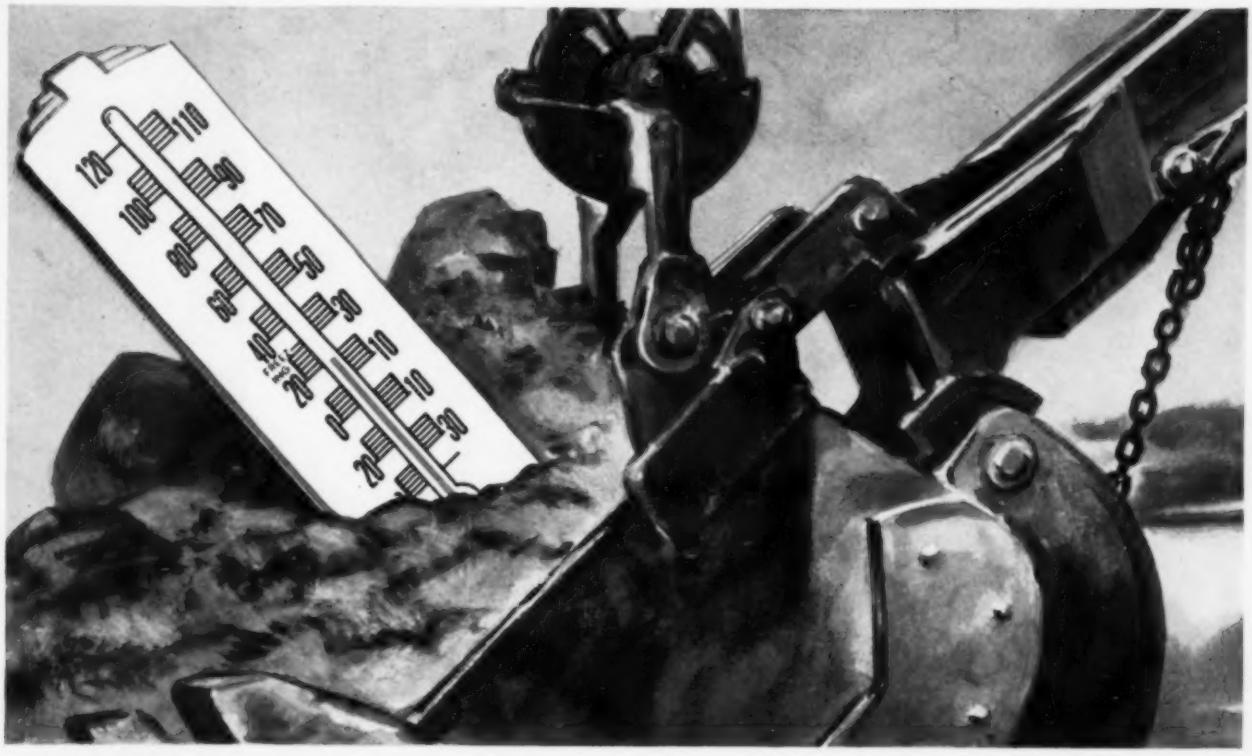
R/M

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

Let it freeze...



AMOCO HDX lubricates fast!

The freeze is *on*—Amoco HDX Motor Oil is *in*—and all's well with your stripping-operation diesel engines.

Even in coldest weather, this low-pour-point engine oil works right into fast-moving parts, insures easy starting! It lasts longer, too. Amoco HDX Motor Oil is high-detergent, non-gumming, non-corrosive . . . *safer* for those heavy-duty engines. Keeps them running cleaner, smoother. Actually *lengthens* engine life.

Amoco HDX is the *oil* you need to service *all* your diesel operated stripping equipment—*most economically!* Consult your nearest Amoco man right away.

AMOCO LUBRICANTS

. . . SURE • SAFE FOR MINE MACHINERY

AMERICAN OIL COMPANY

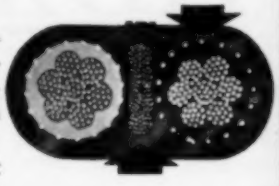
"PACHYDERMATOUS" MINE CABLE

helps keep your mining continuous

That's a five-dollar way of saying that Rome 60 Mining Cables have elephant-tough hides . . . that they're thick-skinned, able to take it.

Of course, any mining cable will wear out eventually. But the right cable will minimize cable service problems, cut down time, keep your machinery producing.

As a good example of what a properly designed cable can mean to you, check these money-saving features of Rome 60 Parallel Duplex Cable.



1. **Flexible**—Tough Neoprene webbing separates the grounding conductor from the insulated conductors. This gives you high impact resistance, low conductor fatigue, better protection against "shorts," while maintaining maximum flexibility.
2. **Interlocked Construction**—This cross section shows what interlocked construction is . . . the open braid around each conductor locks the conductor to the Neoprene sheath. This interlocked construction prevents separation of conductors from sheath caused by twisting, pulling, flexing.
3. **Overload Protection**—The insulation is compounded for heat resistance to permit continuous operation at 75°C. (167°F.) and adequately protects against deterioration at the high overloads often experienced.
4. **Tough Outer Sheath**—Tire-like toughness is given by the molded-in-lead Neoprene sheath. It protects your cable against impact, acids, oils, abrasion and flame.
5. **Meets Codes**—The Neoprene sheath, marked P-105 BM, conforms to State of Pennsylvania and Bureau of Mines Safety Codes.

When you invest in Rome 60 you make your total investment in men and machinery pay off best.

Abrasion—Tire-tough compact construction, molded in lead, protects Rome 60 Mining Cables against abrasion.

Twisting—The firm interlocking braid prevents loosening of conductors and sheath separation because of twisting and bending.

Immersion—Protection against moisture, corrosion and flame assured by the rugged sheath and specially compounded rubber insulation.

Crushing—The Neoprene web between insulated conductors and grounding conductor provides high impact resistance, protects against "shorts."

Photo, courtesy of Joy Manufacturing Co.

To keep men and machinery working, tough, dependable electrical cable is a must. Rome 60 ® Mining Cables can help you get more tonnage.

Quality mining cables and cords

- **Multiple-conducter power cables—Types W and G**
- **Type SO portable cords**
- **Single-conductor locomotive cable**
- **Mine power distribution cables**
- **Shovel and dredge cables**
- **Shot firing cord**

It Costs Less to Buy the Best

ROME CABLE Corporation
ROME · NEW YORK
TORRANCE · CALIFORNIA

PLEASE SHOW THIS ADVERTISEMENT TO YOUR BLASTING FOREMAN

Use this loop-lock half-hitch to connect a trunk line with a branch line of Plastic Reinforced or

PLASTIC WIRE COUNTERED PRIMACORD

This type of Primacord is highly resistant to abrasion and shearing. It is also extremely strong (300 pounds tensile). It is waterproof, and resistant to acids . . . . All of which makes this type the ideal Primacord for use with metal and fibre explosives containers . . . in deep, jagged, wet holes . . . wherever down-hole conditions are *tough*.

Plastic Wire Countered Primacord is far less flexible than the Plain and Reinforced types, and its plastic covering is *smooth*. So, play it safe . . . use a continuous, unbroken length in the hole, and attach the down line to the trunk line at a right angle with the loop-lock half-hitch shown here.

1. Bend a figure eight (8) in the Plain or Reinforced Primacord trunk line. This will be your half-hitch.

2. Loop the end of the Plastic Wire Countered Primacord branch line and pass this loop through the figure eight as shown.

3. Pull the Primacord trunk line *tight* so that the half-hitch grips the doubled-over branch line below the loop.

4. Pass the free end of the branch line Primacord up through the loop as shown above. It can't slip off now!

See your Explosives Supplier, or write to

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of the Coal-Mining Industry

Coal Age

NOVEMBER, 1955

IVAN A. GIVEN, EDITOR

Still Favored

CAN COAL meet the coming challenge of atomic power? Among those who believe that atomic power is coming and that it will compete with coal in the generation of electricity is Philip Sporn, president of the American Gas & Electric Co. But, he asked in an address at the annual meeting of the Pocahontas Operators' Association last month, "Will coal be conquered, or even hurt?" Not likely, was his answer. In fact, he concluded, coal can emerge far stronger than it is today if it takes the proper steps to meet the challenge. Among them are:

1. Full recognition by coal of its opportunity and of its corollary responsibility for providing a reliable supply of fuel at all times at the lowest cost consistent with safety, a sound wage structure, and a reasonable return on investment.

2. Recognition of the fact that atomic fuel is "freightless' fuel, meaning that it is time to think, plan, talk and act on the basis of the *delivered* cost of coal.

3. Establishment of the closest possible relationships with the principal users of coal as a basis for maximum emphasis on increasing utilization efficiency.

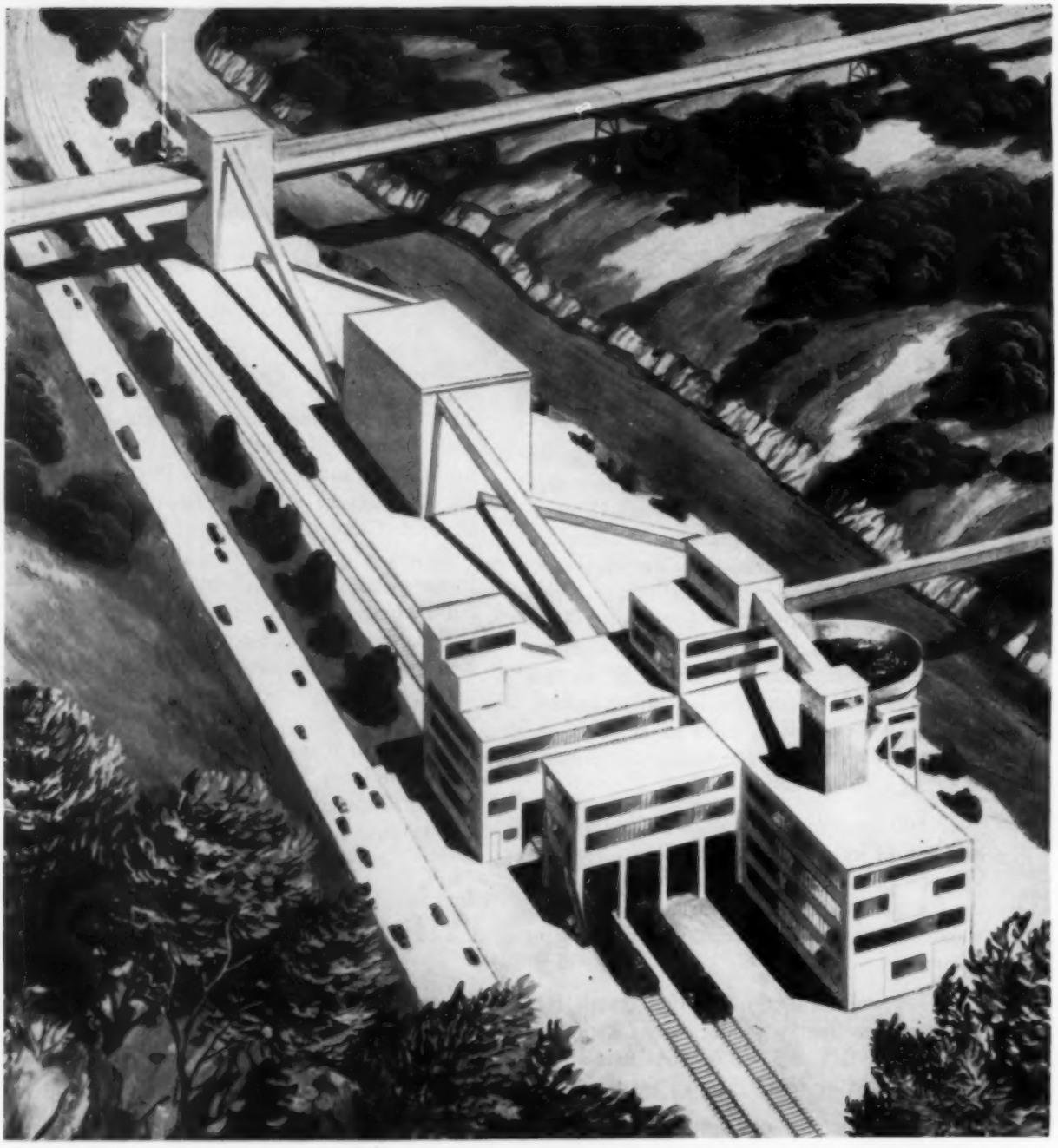
4. Particular concentration on markets that can be protected and held "not for the next decade but perhaps for the next century."

Working independently and looking forward only to 1960, *Coal Age* also offers an analysis of industry problems and suggestions for their solution, starting on the following page of this issue. With these and other recommendations for action comes increasing evidence that action will be forthcoming. For example, October also brought an announcement that construction was starting on the coal-storage and handling facilities necessary for building and operating the Pittsburgh Consol coal-carrying pipe line from Georgetown, Ohio, to Cleveland.

So coal can report that it is working on all fronts—and with increasing effectiveness—to build up its competitive power and meet all reasonable standards for cost, quality and service now and in the future. And as it increases its efforts, it can expect a greater reward. Mr. Sporn, for example, believes that if coal does the job right it can fend off atomic power almost completely for a decade or more, and can look forward to a possible demand for over 200 million tons for electric power in 1965.

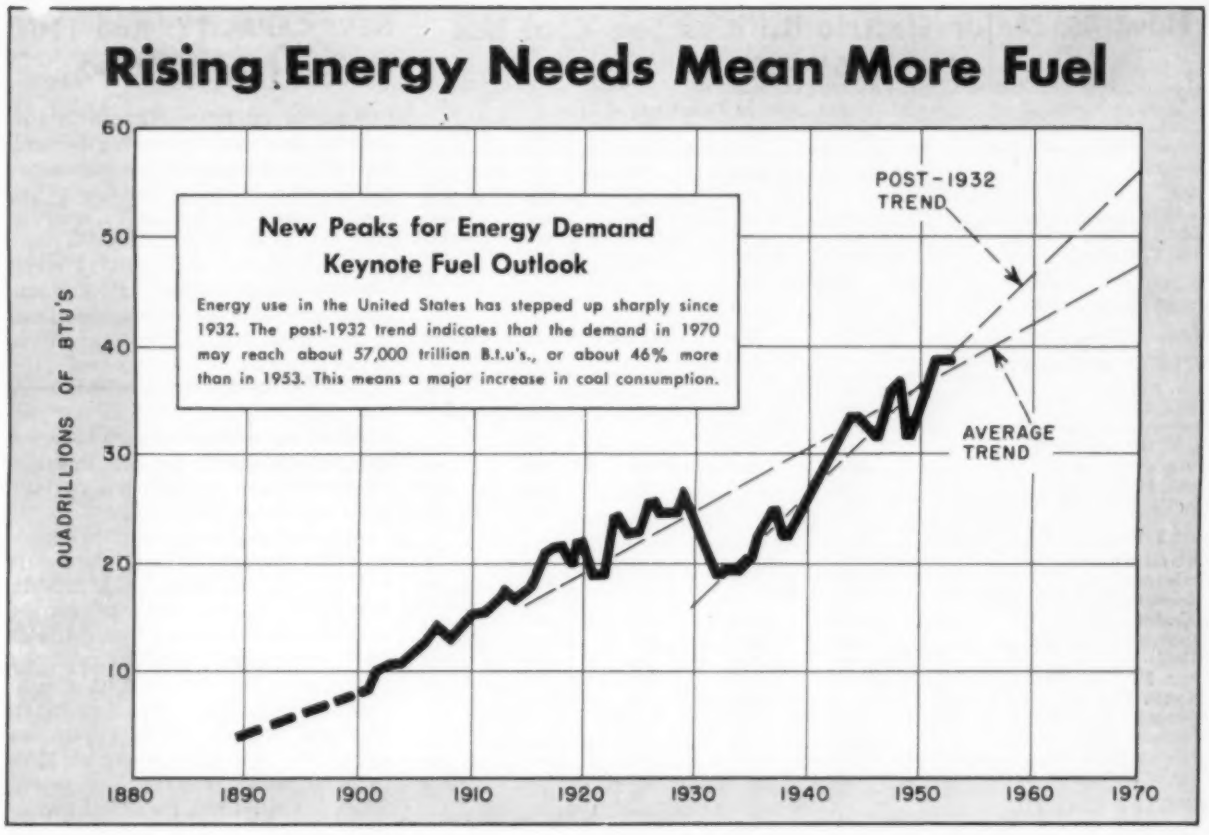
After Lewis—What?

"WHAT WILL HAPPEN when John L. Lewis is no longer president of the UMWA?" This was the opening sentence in an article bearing the title of this editorial in the June, 1953, issue of *Coal Age*. The events of the past month make the question even more pertinent now. The time for a change is appreciably closer, though it may be later than sooner. And when it does come, the transition may be troubled or it may be peaceful. In any event, new personalities and new power alignments must be reckoned with, and the industry may be confronted with a period of confusion and the need for revising labor-relations policies and approaches—perhaps radically. Naturally, the overriding goal for the industry is emergence from the transition period in a strengthened condition in a minimum of time. Perhaps now is not too soon to start thinking about ways and means.



Pattern For Plants To Come?

With a new billion-ton frontier ahead, one of coal's big jobs for the immediate future is planning for the increased production capacity that will be required.



Planning For 1960

At least 600 million tons a year is in the cards for the bituminous industry by 1960–and maybe more if coal takes full advantage of its opportunities to improve its competitive position. This calls for increasing production capacity, cutting costs, improving merchandising methods, seeking fair deals in labor and legislation, and expanding research and public relations. Big needs: careful planning, aggressive effort and imagination—NOW

By W. A. RALEIGH JR.
Assistant Editor, COAL AGE

THE UPSWING IN COAL PRODUCTION is well on its way. From a postwar low of 392 million tons in 1954, output has bounced back to a point where 1955 will see a production of 470 million tons or more if cars are available, and 465 million tons even if the car shortage continues. In 1956, production may increase to 500 million tons or more; by 1960, to 600 million tons; by 1965, to 750 million tons; and, by 1975, to 1,000 million tons.

These projections are based primarily on a rapidly expanding U. S. economy which will bring greater use of coal by coal-consuming industries, particularly electric power, steel, chemicals and atomic energy. The projections assume that there will be no "hot" war, that there will be no major depression, and that coal will be able to maintain, or possibly improve, its competitive position with other fuels.

Not much can be done by the coal industry to reduce the risk of a hot war or major depression. Such cataclysms result from forces far beyond the control of any single industry. But a great deal can and must be done to maintain the competitive position of coal. Herein lies the key to realize the unique opportunity ahead for expansion in coal markets.

To maintain its competitive position, and capitalize on future oppor-

How 42 Major Electric Utilities See Coal Use 1955–59

	Burn in Thousands of Tons				
	1955	1956	1957	1958	1959
TVA and Atomic Energy					
TVA	14,853	17,571	18,500	19,700	21,600
Electric Energy, Inc.	3,000	3,000	3,000	3,000	3,000
Ind. Ky. Elec.	1,636	3,897	4,290	4,290	4,290
Ohio Val. Elec.	1,146	3,182	3,350	3,350	3,350
Private and Municipal					
NEW ENGLAND					
Western Mass. Elec.	300	325	475	650	650
MIDDLE ATLANTIC					
Con. Edison	4,800	.....	.....	5,556	5,834
Phila. Elec.	3,220	3,680	3,865	3,880	3,860
Duquesne Light	3,110	3,030	.....	.....	.....
N. Y. State E. & G.	1,010	1,010	1,065	1,120	1,175
Rochester G. & E.	675	749	781	790	850
Cent. Hud. G. & E.	325	334	345	360	370
Rockland L. & P.	240	257	260	265	270
EAST NORTH CENTRAL					
Detroit Edison	4,725	4,866	5,060	5,251	5,520
Consumers Pwr.	3,182	3,261	3,517	3,854	4,196
Cleveland E. I.	2,756	2,742	2,948	3,068	3,124
Pub. Serv. of Ind.	2,304	2,359	2,525	2,605	2,774
Cincinnati G. & E.	1,908	1,907	2,031	2,130	2,289
Illinois Pwr.	1,375	1,502	1,566	1,682	1,766
Cent. Ill. Pub. Serv.	1,250	1,100	1,200	1,250	1,300
Dayton P. & L.	935	1,020	1,085	1,130	1,195
Wisconsin Pub. Serv.	505	545	590	630	650
Northern Ind. Pub. Serv.	435	468	646	693	734
Madison G. & E.	200	215	235	245	260
City of Detroit P. L. C.	168	175	185	198	193
SOUTH ATLANTIC					
Duke Pwr.	3,770	3,700	3,950	.....	.....
Potomac Elec. Pwr.	1,357	1,374	1,416	1,506	1,539
Carolina P. & L.	1,200	1,500	1,800	1,900	2,000
Potomac Edison	582	619	663	.....	.....
Delaware P. & L.	446	432	443	475	480
Eastern Shore P. S. of Md.	246	267	340	360	387
Gulf Pwr.	144	146	140	.....	.....
Southern Carolina P. S. A.	122	145	156	178	195
WEST NORTH CENTRAL					
Union Elec. of Mo.	2,482	3,323	3,644	3,820	4,040
Kansas City P. & L.	1,033	1,105	1,234	1,310	1,464
Minnesota P. & L.	440	490	540	590	645
Iowa Southern Utilities	250	263	275	288	300
Iowa P. & L.	348	418	446	471	498
Interstate Pwr.	197	210	225	230	240
Iowa-Illinois G. & E.	178	247	314	360	435
Kansas P. & L.	120	150	163	180	194
EAST SOUTH CENTRAL					
Louisville G. & E.	1,400	1,500	1,650	1,800	2,000
MOUNTAIN					
Pub. Serv. of Colo.	337	276	357	434	550
Projected U. S. Total	140,000	155,000	165,000	174,000	180,000

Estimates of utility coal consumption listed are as reported to *Keystone Coal Buyers Manual,* August through September, 1955.

tunities, the coal industry has these nine major tasks to perform:

1. Making sure that production capacity is adequate to satisfy future demands.
2. Maintaining or reducing production costs through increased operating efficiency and mechanization.
3. Improving merchandising methods for better selling of consumers on the merits of coal and coal-burning equipment.
4. Checking constantly on existing, new or growing markets for opportunities to increase sales.
5. Providing reasonable wages to labor.
6. Reducing mine-to-market costs.
7. Campaigning for fair treatment in state and national legislation.
8. Expanding research to develop new or improved techniques on how to use, market and produce coal.
9. Conducting an industry-wide public relations program.

NEW CAPACITY: Add 110 Million Tons by 1960

Basic to all future growth in the coal industry is the planning for and investment in increased production capacity. This planning should be figured so that production capacity is kept at least 10% ahead of anticipated market demands. Present effective capacity taking into account seasonal layoffs, week-ends, vacations, etc., is about 550 million tons, which is safely ahead of the expected 470-million ton market for 1955. However, the safe margin of 1955 is not the result of the addition of new capacity but instead reflects the fact that the excess capacity of 1950 has not yet been completely absorbed.

A further drop in production capacity could severely handicap the industry in meeting future increases in demand if the projected 1960 market of 600 million tons is to be realized. This means that capacity must be upped from 550 million tons now to at least 660 million tons then. Such increased capacity would require an estimated annual investment of $176 to $200 million for the 5-yr period 1956 through 1960, or a total investment of $880 to $1,000 million. The new capacity of 110 million tons would, of course, be additional to the replacement of exhausted mines to maintain the 1955 capacity level.

One question might be, "Why should I increase capacity when I can't get enough hoppers to handle present orders?" In answer, some comfort may be derived from the fact that relief for rail car shortages is underway. Since February, railroads have jumped their spending plans by 20%, with all of the increase for equipment, according to a survey by the Department of Commerce and the Securities and Exchange Commission. The Norfolk & Western, for example, has 2,500 new open-top cars on order, the Baltimore & Ohio, 1,550 hoppers, and the Virginian, 800 hoppers. Car bottlenecks, usually temporary, should not limit long-range plans.

"There is a fine outlook for increased coal production in the next 5 yr. The high national and international industrial level points to coal topping 500 million tons annually within 2 yr—this in spite of domestic and railroad consumption losses attending an industrial revolution in the fueling of America. A strong

***sales program needs to be built on a ready to serve basis. This requires a fair competitive price to build and operate the mine plants to supply the steel, power, heating and chemical needs for coal. No nation has been industrially great without an adequate supply of coal. It has been amazingly important in the industrial and social growth of America. Now and for the long years ahead, America can depend on coal—our national heritage."*— L. C. Campbell, vice president, Eastern Gas & Fuel Associates, Pittsburgh, Pa.**

Coal Needs for Total Power, 1955—80

Year	Millions of KW Generating Capacity Nuclear	Hydro	Steam	Total	Coal Use, Millions of Tons
1955	0	26	90	116	140
1956	0	27	98	125	155
1957	.01	28	103	131	165
1958	.14	34	108	142	174
1959	.14	38	116	154	180
1960	.94	40	127	167	210
1965	5.00	50	177	232	282
1970	10.00	60	226	320	393
1975	40.00	70	285	395	430
1980	120.00	80	314	514	470

Generating capacity based on contracts now placed for operation 1955–58; estimates of *Electrical World*, a McGraw-Hill publication; and estimates of General Electric Co. Coal use estimates based on research by *Keystone Coal Buyers Manual*, a *Coal Age* affiliate.

OPERATING COSTS: Streamline

The ability of coal producers to develop or maintain a price advantage over other fuels could in itself make the difference in determining whether or not the industry realizes its fullest, future growth. Producers must strive constantly for maximum output of quality products at lowest possible cost. And this task will be a difficult one since the cost of labor, equipment and supplies are more likely to go up than down in the future.

Basic to the task is the development of output "yardsticks" which will set standards for how much a man or machine should do in a given unit of time; the addition of mechanized and automatic equipment where it is indicated that such investment will be more than written off in reduced cost per ton of coal mined; and the selection of competent managers to integrate the units of the production operation into a smooth-working whole. Economies will also continue to be achieved through the consolidation of more mines under one management.

Let those who might be dismayed by the difficult task ahead recall that in the 20 yr period, 1934-53, the more effective use of men almost doubled output per man per day from 4.40 tons to 8.17 tons. This big jump in productivity was largely due to the rapid growth in use of mechanical loading equipment, particularly mobile loading machines, scrapers, duckbills and other self-loading conveyors which, as a group, handled about two-thirds of total underground production in 1953. Future expansion in use of such equipment will be relatively slower. But the advent of continuous mining machines, which handled only about 3.5% of total underground production in 1953, has opened up a virtually new field for increased mechanization and greater output per man per day. The 1960 potential for the industry's overall average output per man per day is indicated from a 1954 survey conducted by *Keystone Coal Buyers Manual*, a *Coal Age* affiliate. With about 20% of tonnage reporting, this showed that output per man per day in 177 of the nation's coal mines was averaging 16.42 tons.

MERCHANDISING: Organize; Take Story to Customer

The existence of a great potential for expanding coal sales is one thing; to realize the potential is completely another. One of the primary weapons for realizing the potential is better merchandising methods. Better selling can take numerous forms. However, present trends point in two main directions: organized, cooperative, concentrated selling by a group agency; and more personal effort to convince consumers on the merits of coal and coal-burning equipment.

One of the outstanding efforts in cooperative selling has been the Appalachian Coals, Inc., the pioneer regional marketing agency representing its producer-owners in the southern high-volatile, or District 8, field. In over 21 yr of existence, the agency has sold more than 600 million tons of coal to 31 states of the United States and to overseas countries. For that tonnage, it is estimated that ACI's mass selling power has brought $150 million more in returns than would have otherwise been possible.

Conditions in bituminous which led to the organization of ACI now are present in more aggravated form in the anthracite-producing regions. As one result, producers in the Wyoming (Pa.) region are currently studying how they may set up a single agency to sell anthracite for the group. Possible benefits from the proposed Wyoming Anthracite Sales Co. include elimination of dumping and price slashing, and better engineering of sales to fill specific needs of customers.

In all of coal's history, it is doubtful if the time has ever been riper than now for cashing in on aggressive personal selling. Among the factors creating this favorable merchandising climate are the lessening price advantage of oil and natural gas, the higher quality and greater variety of coal products, new uses and markets for coal, and the availability of automatic, more efficient, more convenient coal-burning equipment.

If old customers are to be recovered, new ones found and existing ones held, the components of the revitalized coal sales story must be exploited. Some progress is being made in this direction. In a number of cases, for example, where original plans called for using oil in schools or housing projects, "Minute Men" groups have converted officials on the superior merits of coal and coal-burning equipment. In another instance, the "Anthracade" mobile display of automatic anthracite heating units has been touring many localities of the anthracite marketing area in a concentrated effort to promote greater use of hard coal for space heating in homes and office buildings.

"The increasing population and expanding economy will provide a natural base for pushing coal sales upward. Utilities, steel, aluminum and export should be the biggest growth

***markets. To fortify coal's future, better selling and merchandising methods are needed. Every coal-producing region should consider a regional marketing agency for selling strength. This is a well-proven method which encourages sales at the best available market price and provides block tonnages that can be offered in larger volume without the usual disturbing effect of irresponsible offers. The pooling of interests also permits market research, sales promotion, sales training and other beneficial activities frequently too large in scope to be undertaken by a single company."*—Julian E. Tobey, president, Appalachian Coals, Inc., Cincinnati, Ohio.**

MARKET ANALYSIS: Sharpen, Extend

More scientific market research is needed. This should include constant analysis of the prices of competitive fuels and the development of "imaginative" promotion lists which cover potential as well as existing customers. Such information would alert producers and distributors on where and when to pinpoint sales campaigns, whether these be aimed at home, industrial or commercial markets. The following are typical reports which indicate promising opportunities for increasing sales:

The use of electric power by major atomic energy plants has jumped from 2 billion kwh in 1945 to an estimated 43 billion kwh in 1955. Next year, consumption is expected to hit 61 billion kwh, 80% of which will be generated by coal.

A new model Campbell stoker was reported ready for production about September 1 by Automatic Solid Fuels, Inc. The improved model, following the successful reception of its predecessor, offers real hope for progress in the home market.

The Reynolds Metals Co. has announced plans to use coal to power a huge increase in primary aluminum capacity at a new Ohio River Valley plant. Richard S. Reynolds, company president, described the development as "marking the emergence of coal as a major source of electrical energy for aluminum production."

The Tampa Electric Co., reporting plans for its new Black Point plant, said that this would be the first major utility in Florida and the Gulf area to use coal for electric power production. TECO president, W. C. MacInnes stated that the use of coal, precipitated by the increasing cost of oil, would guard against future cost increases and might well enable lowering rates later.

The Pittsburgh Consolidation Coal Co. recently bought a chemical plant in Newark, N. J. This is expected to provide an outlet for coal carbonization products in the making of raw materials for the chemical and plastics industries. As such projects materialize, the company looks for further expansion in its chemical refining operations.

A noted authority on hydroelectric development in the Pacific Northwest believes the area's power shortage, even more critical now than 4 yr ago, will continue for the next decade unless steam power plants are constructed. He adds that steam-generating systems, using a new "cyclone" furnace, can burn Washington coals successfully and produce electricity which would be "economically competitive with hydroelectric generation."

Exports of bituminous coal, including those to Canada, added up to 21 million tons for the first half of 1955—63% higher than last year's corresponding period. West Germany, one of the largest overseas markets, is expected to increase imports of U. S. coal by more than 100% during the last quarter of 1955. And representatives of German steel works have figured that total 1955 imports of U. S. coal will hit 5,000,000 to 6,000,000 tons, as compared to 1,800,000 in 1954.

"With expanding utility consumption we are very hopeful that the next 5 yr will see the coal industry on a profitable basis. Aggressive sales effort and reduced production costs will be necessary to meet oil and gas competition." **— Stuart Colnon, president, Freeman Coal Mining Corp., Chicago, Ill.**

LABOR: Relate Pay to Production

In the wake of 1955 production increases and general improvement in the coal industry, the UMWA and the nation's bituminous operators agreed in August on a record $2 pay raise and other benefits. Temporarily, this will take care of labor's needs. But, if production continues to rise as projected, pressures will start again for further pay increases. Producers who recognize that labor peace is vital to realize full expansion in coal markets should be prepared to give "reasonable" wage boosts as labor's fair share of the fruits of increased output. Although hard to pin down to the specific, "reasonable" might be defined as being that point beyond which further wage increases will put the price of coal at a competitive disadvantage with other fuels.

MINE-TO-MARKET: Reduce Costs; Diversify Methods

Mine-to-market costs will be a major factor in coal's battle to hold prices down. There should, therefore, be no let up in efforts to reduce or prevent increases in rail coal freight rates. At the same time, the current trend to develop the use of alternatives to rail transport should be encouraged. One alternative in increasing use is to ship by inland waterways. Another is to sell industrial customers on locating their plants near coal deposits. Promising but still relatively undeveloped are systems of transporting coal by overland belts and pipelines. Perhaps breaking the barriers to wider use of such systems, however, was the announcement on June, 1955, that the Pittsburgh Consolidation Coal Co. would build the first commercial coal-carrying pipeline in the United States. This will extend 108 mi from Georgetown, Ohio, to Eastlake, Ohio.

LEGISLATION: Push Redress Where Needed

The campaign must be continued to remove governmental barriers against free access to markets on a competitive basis. Legislation should not give other fuels so great a competitive advantage that it becomes unprofitable for the coal industry to keep production at levels consistent with national security and an expanding economy.

In keeping with such philosophy, the industry took action this year to stop continued raiding of coal's boiler fuel markets by natural gas, as sanctioned by the Federal Power Commission. The outcome of at least one case has been favorable to coal; decisions on a number of others are pending. Also, responding to pressures from coal and domestic oil producers, the Office of Defense Mobilization in September ordered oil importers to

cut excessive imports of residual oil voluntarily or face compulsory curbs.

Despite these efforts, much work remains to be done. The National Coal Association has defined the legislative program and objectives as follows:

1. Quantitative restriction of residual oil imports and equalization of tariffs with other petroleum products.
2. Elimination of dumping of natural gas at less than cost.
3. Control of natural gas imports.
4. Opposition to government subsidy of atomic power plants.
5. Opposition to the construction of hydro and steam plants with public funds.
6. Adequate protection for coal in reciprocal trade agreements.
7. Elimination of discrimination against coal in government purchases.
8. Provision for a percentage depletion allowance that is fair compared to the allowance granted competitors.
9. Fair treatment in income and payroll taxes.
10. Immediate elimination of the transportation tax on coal.
11. Opposition to unreasonable increases in the minimum wage prescribed by the Fair Labor Standards Act.
12. Elimination of the practice of loading deficits in certain railroad services onto other commodities, including coal.
13. Retention of the rule requiring the ICC to consider the effect of rate changes on traffic.
14. Opposition to further exemptions from the commodities clause of the Interstate Commerce Act.

***"The industry is alerted to the overall needs in competing with other fuels, legislatively as well as in active promotion of the modern usage of coal. The job is integrated and therefore of primary concern to all segments of the industry."*—M. L. Patton, president, Truax-Traer Coal Co., Chicago, Ill.**

RESEARCH: Expand Existing Projects

Too much emphasis cannot be placed on the need for greater investment in the development of new or improved products, equipment and methods of production. In the last quarter-century, science and technology have become the touchstones of industrial progress. This has been most dramatically revealed in the growth of the aluminum, aviation, electronics, atomic energy, and chemical processing industries. While the coal industry has begun and is currently conducting some highly significant research work, the overall investment is small compared to other industries. The average rate of research investment in industry is about 2% of sales. On this basis, the coal industry should be spending $40-50 million annually, whereas the current expenditure is from $5-10 million annually.

The direction of coal research has been well-conceived. Among the outstanding projects, for example, have been those concerned with the production of chemicals and oil from coal, the gasification of coal at the mine, and the development of overland belt and pipeline systems for transporting coal, automatic equipment for space heating, the coal-fired gas turbine and continuous mining equipment. With a few exceptions, however, such research efforts have seen only limited application.

Therefore, one of the most cogent needs is to expand investment in existing research projects to speed their wider commercial application. Since coal is currently considered to have a greater potential for cost reduction in future years than competitive fuels, the time is ripe for greater investment in development research. By greater investment now, the coal industry will be prepared to reap the benefits as price advantages for coal occur. The gains of research are not won overnight. More often, they are won over the years by the vision of men dedicated to future opportunity.

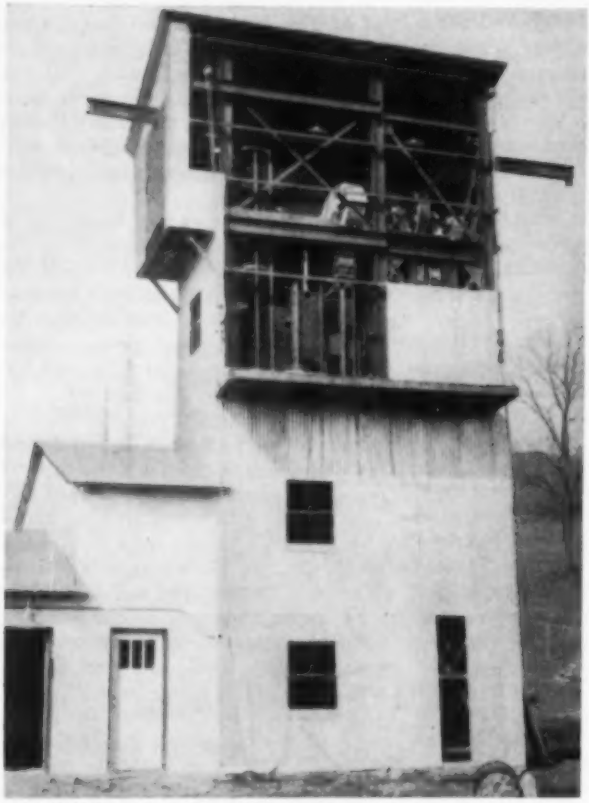
PUBLIC RELATIONS: Seek Industry-Wide Program

The largest industries and most successful companies have long realized that selling the public is second in importance only to selling customers, although benefits from the former are usually more remote and less recognizable than those from the latter. Public opinion and attitudes are frequently the ultimate determinants or activating forces in many issues, as, for example, in the obtaining of investment funds. And developing confidence with the public is the result of persistent, programmed effort over a period of years. Many individual coal companies today do a fine public relations job. The need is greatest on the industry-wide level.

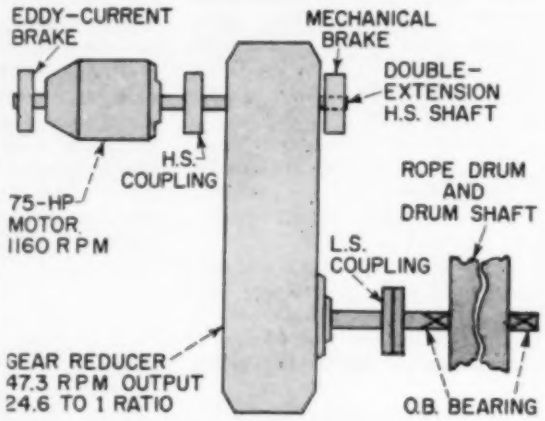
An aggressive, industry-wide and industry-supported public relations program should be generally aimed at educating the public on the vital role of coal in the nation's economy. More specifically, it should be designed to eliminate the public notion that the industry is "sick." As simple as some may seem to men in the industry, such points as the following could be publicized more widely to dispel popular misconceptions:

1. Coal is the energy backbone of the country. It represents 98.4% of the country's reserves of fossil fuels, oil 7/10 of 1% and gas 9/10 of 1%. Coal supplies about 42% of the nation's demands for fuels and power, petroleum 25%, natural gas 27% and hydroelectric power, less than 6%.
2. It is entirely possible that at least part of future needs for oil and natural gas will be met through their synthetic production from coal.
3. Steel and electric power, two of the country's largest and most basic industries, are coal's biggest markets—not home heating and railroads.
4. Atomic energy, frequently considered a threat to coal's existence, depends very heavily on coal for its existence. Major atomic energy plants are expected to use about 61 billion kwh of electric power in 1956, 80% of which will be generated by coal.
5. Coal is important to a wide variety of industries. It helps make cement, paper and glass. It is a major source of raw materials for new textiles, plastics, insecticides, explosives, drugs, fertilizers, paints, dyes and perfumes.
6. Coal's markets in home heating and railroads, having declined in recent years, now show possibilities of recovery. In home heating, modern automatic equipment is sparking the comeback; in railroads, it is the coal-fired gas turbine which may eventually operate at costs 60% or more lower than diesels.

***"In my judgment the expanding of coal sales in the next 5 yr will be brought about by further use of coal in the utility market and the metallurgical market. The energy requirements of our country are going to be substantial in the next 5 yr which, in turn, will consume a greater tonnage of coal. The same is true with the expanding steel requirements which will mean more ovens and a greater consumption of coal. To me, these two outlets are the most essential."*—R. E. Salvati, president, Island Creek Coal Sales Co., Huntington, W. Va.**



COMPACT hoist and controls fit neatly in space not covered with metal. Unit can be transported easily to new site.



This hoisting setup . . .
includes these components

Hoist Drive Motor

Westinghouse 75-hp Type CW wound-rotor induction, three-phase, 220/440-v, 1,160 full-load rpm.

Mechanical Brake

Type HI-167 electrical solenoid-operated thruster-type brake set for 214 ft-lb torque, including manual release lever with latching device and interlock switch.

Eddy-Current Brake

Dynamic Type 55W, including DC tachometer coupled on end, pressure switch, temperature switch, valves.

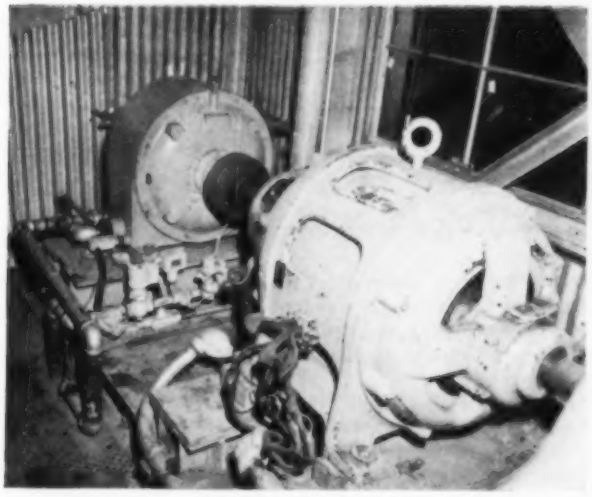
Gear Reducer

Type DHR-20, 1,160-rpm input speed, 47.8-rpm output speed, gear ratio, 24.25:1, shaft extension for brake.

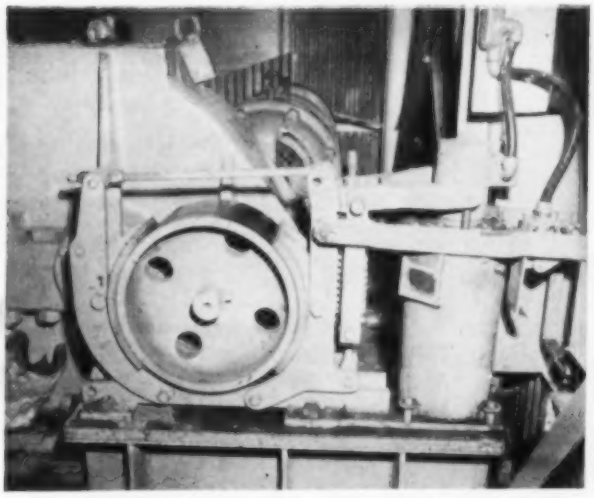
New Ideas Pay Off at Trotter Coal

RETURNING to surface at end of shift, men turn in cap lamps in hoist building.

UNDERGROUND landing area is coated with sand-cement mixture. Crushed limestone covers floor.



EDDY-CURRENT BRAKE applies dummy load to hoist motor, slowing cage as it approaches landing.



THRUSTER BRAKE goes into action after eddy-current brake slows hoist speed and brings hoist to rest.

Low-cost compact friction-type hoist handles specially designed double-deck cage in 72-in borehole at new manshaft saving 45 min travel time.

LOW COST, safety, compactness and simplicity are top features of the new manshaft and hoist installation at the Bunker Mine of the Trotter Coal Co., Cassville, W. Va. As a result of this low-cost installation, Trotter Coal has been able to save an average of 45 min in travel time and increase mine output.

The shaft was completed in July, 1954, when a new-type core drill intersected the mine workings (*Coal Age*, January, 1955, p. 80). The drill hole was lined with steel and several inches of concrete were placed behind it to fill the voids between the liner and the shaft wall. Water rings collect inflow, which is then drained to the foot of the shaft through a 6-in churndrill hole 5 ft from the shaft. The connecting passages between the rings and drill hole were drilled with a jackhammer.

Construction of the surface building housing the hoist, lamp racks and foremen's office began in January, 1955. On March 14, the new hoist and portal were put in service. Construction of the building was speeded by laying the walls with dry blocks and then covering exterior and interior with a sand-cement mixture to bind them together.

Management estimates that the cage, hoist and auxiliary equipment could be dismantled, transferred and reassembled in a new building in about 10 days. All parts can be moved by truck, the heaviest unit being the hoist and gear reducer which weigh 6½ tons.

DESIGNING THE CAGE AND CONTROLS

A special double-deck steel cage was designed and built to fit the circular shaft by the Connellsville Mfg. & Mine Supply Co. Each deck is 7 ft high, has 24.9 sq ft of floor space and can hold 10 men.

Both decks have Westinghouse

REVOLVING DOOR at shaft bottom prevents air leakage between man trip station and shaft.

SIX ROPES support double-deck cage. Other ends of ropes are attached to 8,500-lb counterweight.

NEW PORTAL features compactness and simplicity.

HOIST DUTY

Hoisting distance	487 ft
Net wt, material in cage	4,000 lb
Wt empty cage, including attachments	6,500 lb
Cage type	Double Deck
Net wt of counterweight	8,500 lb
Rope diameter	0.75 in
Rope wt per ft	0.9 lb
Number of ropes	6
Hoist type	Koepe
Diameter, drive pulley	40 in
Diameter, auxiliary drive pulley	24 in
WR^2 hoist rotating mechanical parts	2,934 lb ft
Maximum average cage speed	500 fpm
Reduced cage speed	60 fpm
Maximum drum speed	47.8 rpm
Motor synchronous speed	1,200 rpm
Gear ratio	24.25:1
Operation	Counterbalanced
Overall hoist mechanical efficiency	85%

pushbutton controls for operating the hoist and reset buttons for restarting it if the power should fail. The lower deck is equipped with a phone connected to the mine communication system and to the outside office. If the door on either deck is opened while the cage is in motion, a Westinghouse limit switch on the door stops the hoist and it cannot be started until the door is closed.

To enter the mine, a button is depressed to bring the cage to the surface if it is not already there. A second button is pushed when the cage is at rest on the surface to release the lock on the outer door leading to the shaft. This outer door cannot be unlocked and opened unless the cage is at that level.

The cage doors are not locked but must be closed before the hoist can be operated. After the passenger enters the cage he closes the door and pushes the "down" button, starting the cage on its downward journey. To return to the surface, the procedure is the same except that the "up" button is pushed after the passenger enters the cage and closes the door. It takes 55 sec for an empty cage to make the 467-ft trip and a maximum of 65 sec for a full cage. Two 40-lb rails attached to the shaft wall serve as guides while the cage moves up and down in the circular opening.

FRICTION HOIST LIFTS CAGE

Much of the compactness of the installation is the result of application of a Westinghouse friction-drive AC hoist to lift and lower the cage. With this hoist, a driving pulley replaces the conventional drum. At Trotter there are six grooves in the pulley to accommodate the six ¾-in Bethlehem ropes. The ropes are taken around the grooves so that they contact only part of the pulley. Each of the six ropes is attached to the 6,500-lb cage and to the 8,500-lb counterweight. The load of the cage is divided equally between them.

The multiple-rope principle permits the use of smaller ropes and drive pulleys. With a small drive pulley, the driving motor can be of higher speed or the gear-reduction ratio can be decreased. Thus the hoisting unit can be smaller and lighter. The savings in weight and size make it possible for the hoist to be mounted directly over the shaft. Further, there is a lower peak power demand because of the reduction in inertia of rotating parts.

HOW THE CONTROLS WORK

The automatic hoist controls incorporate features designed to:

1. Provide reversing control with low-voltage protection.

2. Stop the hoist at top or bottom of the shaft by closing track limit switch, No. 1, applying a Dynamatic eddy-current brake that decelerates the hoist at relatively constant rate to low speed. Then track limit switch No. 2 applies a mechanical thruster-type brake, bringing the hoist to a standstill.

3. Permit the hoist to start upward or downward from any position in the shaft by pushbuttons in both decks of the cage.

4. Permit the hoist to be started upward by pushbutton at the top of the shaft or downward by pushbutton at the bottom of the shaft.

5. Prevent movement of the cage unless the gate switch contacts are closed at the top and bottom of the shaft and on the cage.

6. Operate an indicating light at the top and bottom of the shaft, indicating that the hoist cage is in motion.

An emergency-stop button is mounted in each deck of the cage. At each pushbutton station there is a reset pushbutton for resetting the undervoltage protection in case of overspeed, manual stopping on the cage, the Lilly controller protective device being initiated, loss of water pressure or over temperature in the eddy-current brake. The defect must be remedied before the hoist can be put in operation again.

Automatic deceleration of the cage to a slow speed when the cage is approaching the landing is provided by magnetic-amplifier control of the excitation to the eddy-current brake. The eddy-current brake applies a dummy load to the 75-hp Westinghouse AC wound rotor motor, permitting good speed control. Otherwise control is very poor. A limit switch about 50 ft from the landing initiates the deceleration. A DC tachometer and transformer combination compares the actual and the desired deceleration rates through the magnetic-amplifier field. The difference, or error, is amplified and supplies brake excitation. At a slow speed, 60 fpm, a speed-limit magnetic amplifier bypasses the deceleration magnetic amplifier and regulates cage speed at a slow rate until the cage is at the landing and a second track limit switch applies the thruster brake.

The magnetic contactors in the controller of the AC motor driving the hoist are DC-operated. Advantages are: less impact on closing and less wear. Therefore they can withstand severe service better. Lower currents are required and thus there is less wear on contacts of the master switches or auxiliary devices carrying the control currents.

The Coal Commentator

Equally Important

It is the improvements and refinements that bring out the real potentialities of a method, a machine or a type of material—at least in the majority of instances. Coal mining is no exception, and *Coal Age* has been at least a moderately vocal member of the growing group that believes that what you do after you put the machine, method or material into service is more likely than not to be as important in increasing efficiency as the machine, material or method itself.

Take, as an example, a variation in the old-reliable method of driving an entry with shuttle cars and loaders. Eleven headings make up the entry, and it originally was advanced by one loader and two shuttle cars. The change was to two loading machines and three shuttle cars, with the machines working from the outside toward the middle and the first unit to reach it loading out the center heading. Result? A major jump in tons per man with the expenditure of no more than some well-directed mental effort. Driving headings is not the only place such effort can pay off.

Maybe Your Own

S-D Day now takes its place among the days and weeks set side for various purposes and projects from the frivolous to the deadly serious. "S-D" stands for "Safe Driving," and Dec. 1 is the day picked by the President's Committee on Traffic Safety. A look at the record makes it clear that this project is in the deadly serious class. The aim is to demonstrate that traffic accidents can be really cut when all drivers and pedestrians accept individual responsibility for accident prevention. It is a job for everybody, including business and industry. To participate in S-D Day activities, get in touch with the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill. And make your own contribution by driving safely yourself, not only next Dec. 1 but now and every day.

The life you save may be your own.

Determined Anthracite

Anthracite may possibly be surprising even its most ardent fans by the way it has been holding its business in 1955. As a result, though it still will experience a loss, it will be substantially less than many people, including anthracite producers themselves, expected. One reason is the dogged determination of the industry not to be counted out without a fight. With Queen Anthracite, Miss Gayle Charney, providing the glamor, and with a hard-hitting promotion program based on modern equipment and convenient, low-cost, smokeless operation, anthracite is making a dent in public indifference and hostility—with the help, incidentally, of major increases in the costs of competitive fuels. At the same time, it has promising prospects in the industrial field in addition to such established outlets as iron-oxide pigments for paints, generating electric power and so on. Among the new prospects are pelletizing various types of iron ore and supplying a substantial part of a coal blend for metallurgical coking.

Prediction: Real resistance to further tonnage losses and the prospect of a reversal in the trend in the not-too-distant future.

Golden Anniversary

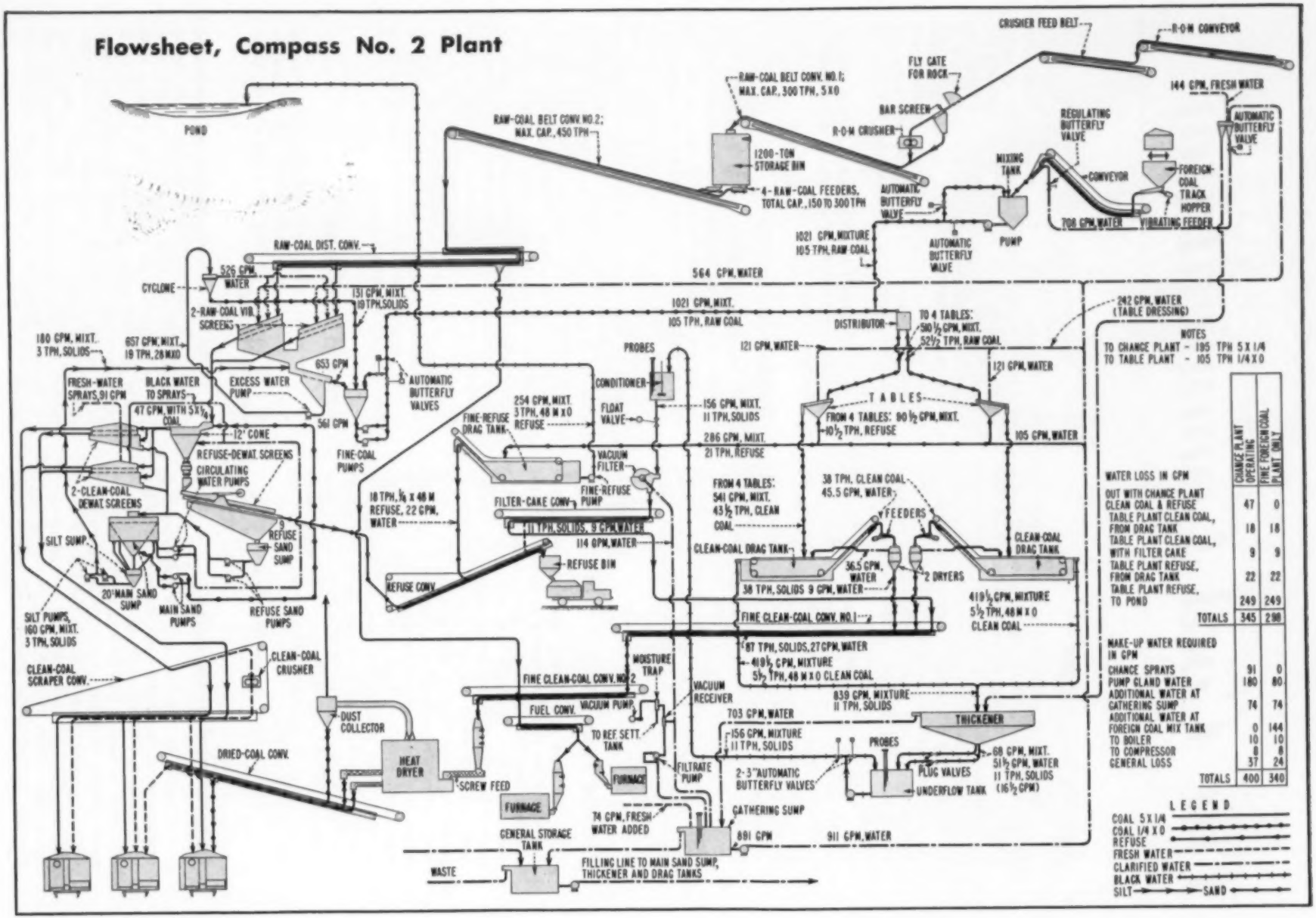
Opening in Pittsburgh of the world's first theater devoted exclusively to motion pictures and driving an automobile over 100 mph for the first time at Daytona Beach were among the spectacular events of 50 years ago. But there were others in 1905 which, though not so prone to figure in the headlines, were destined to be judged as truly significant milestones in progress. One was the publication, in August, 1905, of the first issue of the *O-B Monthly Bulletin*, reflecting, among other things, Ohio Brass' growth from a 20-man plant in 1888 to the world's largest manufacturer of electric-railway supplies. In 1930, the *Bulletin* became *O-B Haulageways*, with an editorial content oriented to the needs of mining men here and abroad. Thus, the September, 1955, Anniversary Issue marks the end of half a century of significant contribution to the broader, safer and more-efficient use of electric power in mining. **A salute to Haulage Ways, and to the Ohio Brass Co., for a job well done.**

Around the Corner?

Is there to be a new industry-wide organization designed to do a more-efficient job for coal on all fronts—perhaps to bear the name of the "American Coal Institute"?

The idea is being talked up more and more, though it still appears that there may be an appreciable lag between idea and actual fact. Nevertheless, its proponents see significant advantages. With better direction and a more-adequate war chest, it would be easier to concentrate the power necessary to get results on industry problems, whatever their nature. This accounts for the growing number of insiders who believe that such an organization will be formed. Some say it may be just around the corner.

Flowsheet, Compass No. 2 Plant



NOTES
TO CHANCE PLANT - 195 TPH 5 X 1/4
TO TABLE PLANT - 105 TPH 1/4 X 0

WATER LOSS IN GPM	CHANCE PLANT OPERATING	FINE FOREIGN COAL PLANT ONLY
OUT WITH CHANCE PLANT CLEAN COAL & REFUSE	47	0
TABLE PLANT CLEAN COAL, FROM DRAG TANK	18	18
TABLE PLANT CLEAN COAL, WITH FILTER CAKE	9	9
TABLE PLANT REFUSE, FROM DRAG TANK	22	22
TABLE PLANT REFUSE, TO POND	249	249
TOTALS	345	298
MAKE-UP WATER REQUIRED IN GPM		
CHANCE SPRAYS	91	0
PUMP GLAND WATER	180	80
ADDITIONAL WATER AT GATHERING SUMP	74	74
ADDITIONAL WATER AT FOREIGN COAL MIX TANK	0	144
TO BOILER	10	10
TO COMPRESSOR	8	8
GENERAL LOSS	37	24
TOTALS	400	340

LEGEND
COAL 5 X 1/4
COAL 1/4 X 0
REFUSE
FRESH WATER
CLARIFIED WATER
BLACK WATER
SILT — SAND

NEW COMPASS NO. 2 PLANT, at Dola, W. Va., tailors 450 tph of Pittsburgh seam to meet customers' needs. Features include total cleaning with cone and wet tables, drying, recovery of extreme fines and provision for future expansion.

Satisfying Today's Customers Coal in Compass No. 2 Design

Industrial and utility users benefit from automatic cleaning control and other modern facilities, while company profits from provisions for future expansion and for handling foreign coal, as well as duplicate units for smooth operation.

MEETING THE NEEDS of today's customers and anticipating future expansion to supply tomorrow's customers were the top aims in building the new Compass No. 2 preparation plant at Dola, W. Va. The 450-tph plant has been operating at full capacity since April 4 washing, drying and sizing coal from the Pittsburgh seam for industrial and utility customers. Plant features include a new automatic density control for the sand-flotation cone that assures a top-quality product at all times; duplicate plant units to reduce the possibility of plant shutdown; provision for future expansion; and facilities for handling foreign coal.

Latest in an expansion and modernization program embarked on in 1945 at properties controlled by the Pittston Co., the Compass No. 2 plant makes available to the Pittston Clinchfield Sales Corp. an additional 1½ million tons of washed Pittsburgh coal per year. During the past coal year, ending in April, 1955, Pittston Clinchfield sold nearly 2 million tons of Pittsburgh coal and now is in position to boost that figure to 3½ million.

Completion of the Compass No. 2 plant marks the $30,000,000 point in the plan to spend $50,000,000 on new improvements and developments, including new facilities to meet the growing demand for a high-quality moderately priced high-volatile coal. In line with this program, the Compass Coal Co. was organized in 1949 as a subsidiary of the Clinchfield Coal Corp., Dante, Va. Starting from a strip mine producing 293,208 tons in 1949, the Compass property continued to expand into a 7,000-ton mine. In 1954 the original Compass mine produced 1,239,000 tons of coal from a highly mechanized all-belt deep mine.

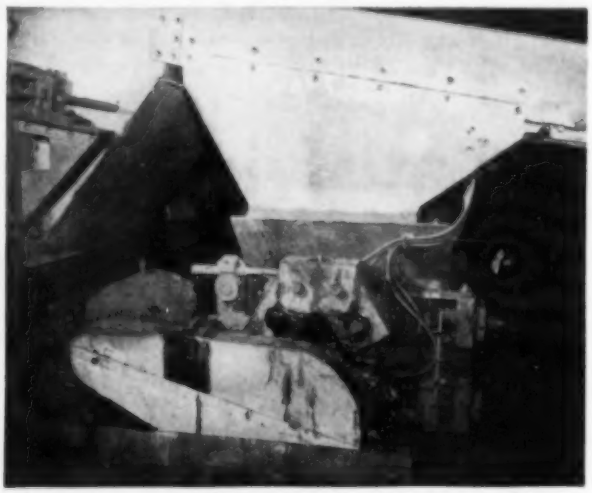
To assure ample coal reserves to supply customers' future needs, the Pittston Co. bought the Compass No. 2 and Chieftain No. 1 mines in October, 1953. Purchase of the mines added 100 million tons of Pittsburgh coal to the Compass reserves. Thus an ample supply was assured for the next 50 yr, making possible expansion to meet the growing demand for well-prepared coal from the Fairmont area.

Shortly after the new property was bought, plans were initiated for the addition of a new preparation plant that would be one of the most modern in the country. Before the new plant was designed, a great deal of engineering research was done to determine the quality of coal that could be expected with a cleaning plant. Special emphasis was placed on finding out what could be done with coal con-

COARSE-COAL CLEANING is done in 12-ft sand-flotation cone equipped with new automatic density control

FINE-COAL CLEANING is assigned to eight wet tables. Plant includes room for doubling units in future.

FINAL DRYING of smaller sizes is done by thermal unit that lowers moisture content to 2% if desired.



TWO-STAGE CRUSHER breaks large sizes of clean coal to make special stoker product with minimum of fines.

taining 4½% or more sulphur. Many full-seam samples were taken from various areas of the mine and special samples also were gathered from the top bench of the seam which normally runs high in sulphur. Washability tests were made on the samples and studied carefully to determine if the sulphur content could be lowered to 2½% without excessive reject in the washing process. Test results showed that raw coal with sulphur in excess of 4½% could be washed efficiently to yield a product with 2½% sulphur. On the basis of these results, management pushed ahead at full speed with plans for a new preparation plant including facilities for washing and drying all sizes.

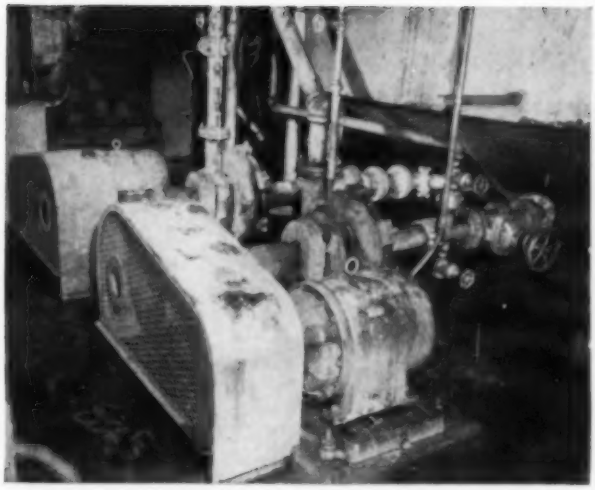
Ground was broken for the plant in August, 1954, and it was turned over and given preliminary tests on March 31, 1955. Construction was rushed to completion through one of the severest winters in northern West Virginia in recent years so that the plant would be available by April of this year. Since April 4 the plant has been operating full scale on a two-shift basis and the fine-coal section has been working three shifts.

Design and construction of the new plant was handled by the Fairmont Machinery Co. Features of the plant include a Chance cone with the new Automatic Density Control for washing 5x¼ coarse coal, eight Deister SuperDuty Diagonal Deck wet-washing tables for cleaning ¼x0 fine coal, CMI and Humboldt centrifugal driers and a Link-Belt Multi-Louvre thermal drier. The plant also has a 50-ft Dorr thickener and an Eimco disk filter for recovering very fine coal from the overflow from the clean-coal drag tanks.

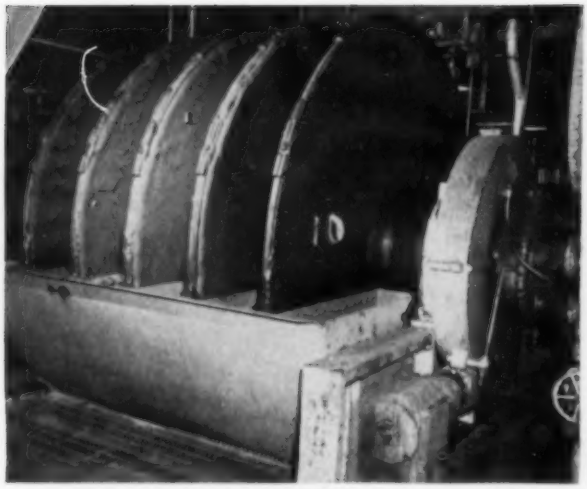
Incorporated in the basic design of the plant were space and provisions for doubling the capacity of the plant in the future. For example, space is available to permit installation of another Chance cone and eight additional tables. Auxiliary equipment, including pumps, conveyors and the like, also are installed in duplicate or designed to handle the larger capacity.

TWIN UNITS PREVENT DELAYS

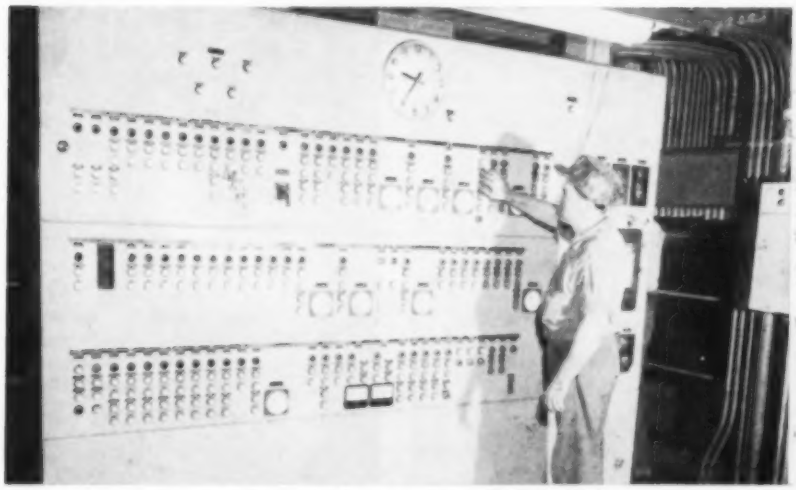
Duplicate equipment assures continuity of operation and was given top consideration in designing the plant. For example, duplicate lines are installed between the Dorr thickener and the Eimco filter and all solids pumps in the Chance cone circuit are duplicated. Spare units are installed so



DUPLICATE PUMPS for all main units permit fast change-over and thus assure continuity of operation.



DISK FILTER recovers 20 tph of extremely fine coal and is key unit in operating with closed water circuit.



PLANT CONTROL is centered at this pushbutton panel board, designed for one-man operation of the equipment.

that they can be put in service in a minimum of time.

The plant also includes facilities for unloading and handling the unwashed slack from the Compass No. 1 mine. Coal is delivered to the plant in railroad cars and unloaded into a 50-ton bin lined with stainless steel. A Robins car shakeout speeds car unloading. From the hopper, coal is delivered to a flight conveyor that carries it to a raw-coal mixing tank. There it is mixed with water and pumped to an eight-way distributor feeding the fine-coal cleaning section by a Nagle pump.

FEEDING THE PLANT

Coal from the Compass No. 2 drift mine is brought to the surface by a series of belt conveyors and elevated to a transfer station where it passes over a bar screen that removes the 5x0. The larger sizes are reduced to 5x0 by a Jeffrey 30x36 double-roll crusher. The two products combine and flow to a 36-in raw-coal belt conveyor that discharges into a 1,200-ton Marietta concrete-stave-type storage bin equipped with a Robt. Holmes & Bros. spiral lowering chute. The lowering spiral prevents degradation that would occur if the coal fell freely into the bin.

The bin serves a twofold purpose. First, it permits the preparation plant to operate at maximum efficiency by feeding a continuous flow of coal independently of the flow from the mine. Thus cleaning units, crushers, conveyors and so on will normally operate under a constant uniform load. Second, it permits third-shift operation of the fine-coal section to clean the ¼x0 coal from Compass No. 1 by providing storage capacity for any coal mined at No. 2 on the third shift.

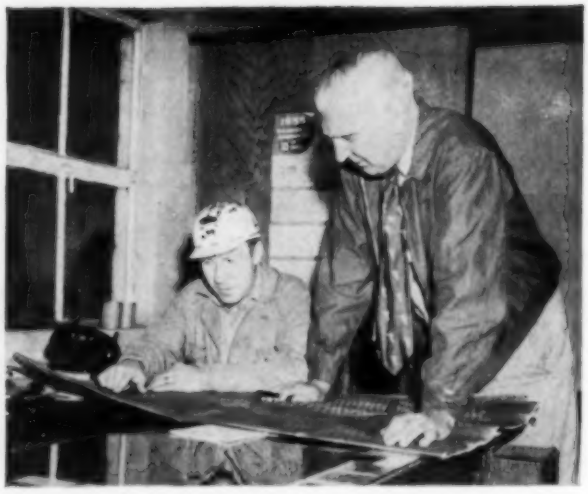
Two raw-coal feeders transfer coal onto an elevating belt conveyor that discharges it onto a 42-in raw-coal distributing conveyor feeding two Allis-Chalmers 6x16-ft Ripl Flow vibrating screens that wet screen the coal into ¼x0 and 5x¼ fractions. The larger size passes to the Chance cone and the ¼x0 flows over a 28M fixed screen that removes the excess water before the coal flows to the fine-coal tank. Excess water and the 28Mx0 coal is pumped to a Heyl & Patterson cyclone that concentrates the solids for delivery to the fine-coal tank. Cyclone overflow is recirculated and used for wet screening.

As the coal flows through the plant it is automatically weighed at various points by Fairbanks-Morse belt scales.

CLEANING THE COAL

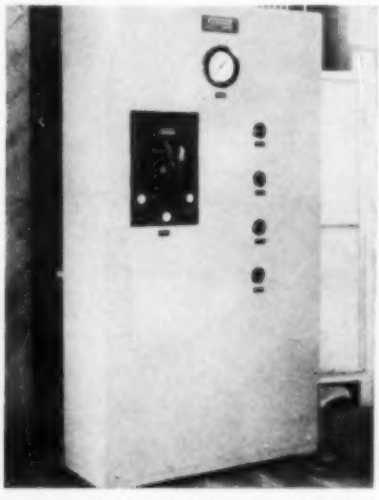
A 12-ft Chance cone equipped with an Automatic Density Control handles the job of cleaning the 5x¼ coal. Clean coal is discharged onto two 4x16-ft Allis-Chalmers Low Head vibrators that separate it into 5x1 egg, and 1x¼ stoker pea. Screen products then flow to a two-compartment clean-coal scraper conveyor and are loaded on any of the three tracks. The plant is designed so that any clean coarse size may be delivered to a two-stage Gundlach crusher and reduced to any size down to ¾ in top size. The crusher is used primarily to make a special high-quality spreader stoker coal with a minimum of fines. Flexibility also is incorporated to permit coarse sizes to be mixed with washed and dried fine sizes before loading.

VERSATILE loader performs a variety of jobs such as cleaning up at slate bin and around loading tracks.



COMPASS PLANNERS—Henry Weatherholt (left), Compass 2 Div. supt., and E. E. Criswell, vice president.

QUALITY CONTROL is centered in laboratory adjoining plant. Results of daily analyses are available to customers and management in a minimum of time.



AUTOMATIC DENSITY CONTROL keeps cone at a predetermined gravity.

AUTOMATIC CONTROL OF CONE DENSITY

Smoother performance and better separation of coal and refuse in the Chance cone is achieved with a new Fairmont Automatic Density Control. The new control is the fifth unit put in operation in the coal industry and is designed to make separation of coal and refuse at a predetermined gravity. Compass, as well as the other operations, report good results with the new unit. Up to the time this control was developed by Fairmont, dependable measurement of cone density was virtually impossible. The new unit makes possible dependable measurements of the density and automatic regulation.

Density changes in the cone are achieved by varying the water supply from each gravity ring to affect the density in the zone above its introduction. Before the new control was developed this was done manually and efforts were made to measure density in each area between the rings. The new control measures the density in each zone by impulse lines that lead to the panel board where it is registered as specific gravity. Once the predetermined gravity has been set on the control board, the automatic control regulates the density in each zone and maintains it at that level.

The density pattern maintained in the cone is said to be remarkably uniform. This feature permits good separation and nearly instantaneous removal of refuse. Thus accumulations of near-gravity material that plug the cone are eliminated. A recently developed rubber-sleeve squeeze-type air-actuated valve that replaces the ordinary hand valves makes possible the rapid changes in gravity.

Typical operating results with the new control at Compass No. 2 are shown in the following sink-float test results:

Refuse	Clean Coal	
	¼x1,	1x5,
% Float	% Sink	% Sink
0.44	0.37	0.32
0.18	0.59	0.27
0.59	0.34	0.28
0.32	0.45	0.27
0.27	0.19	0.18
0.19	0.23	0.21

The fine-coal section of the plant is designed to handle 105 tph of raw ¼x0 coal. About 1,021 gpm of fine coal and water are pumped from the fine-coal tank to an eight-way revolv-

Table 1.—How Compass Coal Analyzes After Preparation

	Slack	Screened Sizes
Moisture	3.1	3.2
Ash	6.5	7.1
Volatile Matter	38.7	38.2
Fixed Carbon	51.7	51.5
Btu (As rcd)	13,671	13,620
Sulphur	2.4	2.8
Ash Softening Temp.	2,170	2,280

ing distributor that feeds equal quantities of raw coal to the eight coal-washing tables. Clean coal from the tables is split and the two equal volumes are directed to separate clean-coal drag tanks. Each drag conveyor discharges to a Jeffrey-Traylor vibrating feeder that delivers coal to a CMI centrifugal drier. A Bird Humboldt unit is maintained as a spare. Moisture content is reduced to about 6% by the mechanical driers and final drying is assigned to a Link-Belt Multi-Louvre thermal drier that can reduce moisture in the final product to 2% if desired. The drier is equipped with a Multiclone dust collector that traps the fine coal in the drier exhaust and returns it to the dried-coal conveyor.

Cleaned and dried ¼x0 is delivered to a flight conveyor and deposited separately in railroad cars on Track 1 or mixed with the clean coarse coal before loading. The ¼x1 stoker pea is loaded on Track 2 and the 1x5 on Track 3.

Overflow from the two drag tanks flows to a 50-ft Dorr thickener. Dual pipelines are provided to carry the thickener underflow to a tank from which it is pumped to an 8x8 Denver conditioner. From there it is fed to an Eimco disk filter that recovers about 20 tph of fine coal. The filter cake is carried to the fine-coal conveyor and mixed with the products from the centrifugal driers.

Refuse from the Chance cone is dewatered and desanded on a Parrish-type shaker screen and is carried by flight conveyor to the refuse bin. Table refuse passes to a fine-refuse drag tank for dewatering before being delivered to the refuse conveyor. Combined refuse from the fine and coarse coal sections is hauled to a refuse-disposal area by truck. Plant reject averages out at about 17%. A Hough Payloader handles utility work such as cleaning up around the refuse bins and loading booms.

Plant operation is handled by a 12-man crew as follows: 4 car droppers, 1 car trimmer, 1 cone operator, 1 drier operator, 1 pump operator, 1 mechanic, 1 electrician, 1 truck driver and 1 foreman.

Equipment and Motors, Compass No. 2 Plant

	Motors Number	Motors Hp. Each
ROM crusher	1	100
Oil pump	1	¼
Raw-coal belt conveyor No. 1	1*	30
Raw-coal storage bin	..	..
Raw-coal feeders	2	7½
Raw-coal belt conveyor No. 2	1*	30
Raw-coal distributing conveyor	1*	20
Furnace fuel conveyor	1*	5
Raw-coal vibrating screens	2	10
Main sand pumps	2	40
Circulating water pumps	2	75
Refuse sand pumps	2	25
Cone agitator	1	7½
Refuse gates	..	..
Sand valve	..	..
Clean-coal dewatering screens	2	10
Clean-coal scraper conveyor	1*	20
Clean-coal crusher	1	50
Table distributor (reversing)	1	1
Coal-washing tables	8	3
Clean-coal drag tanks	2*	7½
Fine clean-coal feeders	2	1
Drier centrifugal drive	1	30
Drier vibrator drive	1	5
Drier oil pump	1	⅓
Centrifugal drier No. 2	1	50
Drier hoist (1½-ton)	..	..
Fine clean-coal conveyor No. 1	1*	15
Fine clean-coal conveyor No. 2	1*	20
Fine-coal feed conveyor to heat drier	1	10
Heat-drier fluid drive	1	30
Feed and discharge screw	1	15
Spill screw	1	3
Exhaust fan	1	150
Dust valve	1	¾
Stoker drive	1	1
Forced-draft fan	1	7½
Dried-coal conveyor	1	20
Thickener	1	2
Conditioner	1	10
Vacuum filter	1	2
Vacuum pump	1	60
Filtrate pump	1	5
Blower	1	3
Refuse-dewatering screen	1	15
Fine-refuse drag tank	1*	7½
Filter-cake conveyor	1*	5
Refuse conveyor	1*	15
Foreign-coal car shakeout	1	20
Car-shakeout hoist	1	6
Foreign-coal feeders	2	1
Foreign-coal conveyor	1	20
Condensate pump	1	10
Blower	1	7½
Air compressor	1	1
Stoker	1	1
Unit heaters	..	..
Air compressor	1	25
Excess-water pump	1	40
Fine-coal pumps	2	50
Silt pumps	2	15
Thickener-underflow pump	1	20
Gathering-sump pump	1	60
Refuse pump to silt pond	1	15
Service pump	1	30
Foreign-coal pump	1	75
Rock gate (reversing)	1	5
Roof ventilator	1	2
Roof ventilator	1	⅓
Control-room blower	1	1½
Building hoist (3-ton)	1	8
Horsepower, sand-flotation plant		477½
Horsepower, foreign coal		153½
Horsepower, fine-coal plant		657¾

*Motoreducer.

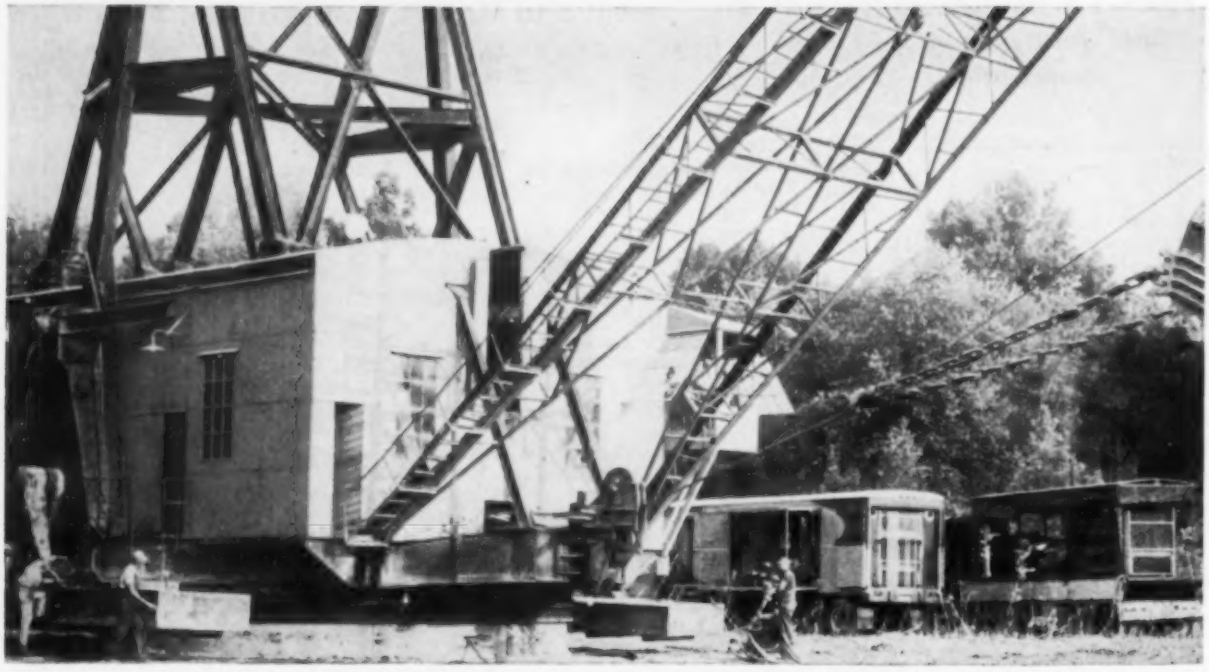
QUALITY CONTROL

Quality control rates top consideration at the Compass No. 2 plant. A fully equipped laboratory was built adjacent to the cleaning plant to permit analyses to be made as quickly as possible. Results therefore can be made available to management and customers in a minimum of time. Facilities are available for making complete proximate analyses and a Gilson mechanical testing screen is on hand for making sizing tests.

All sizes are sampled regularly throughout all the loading shifts and a composite analysis is made for each size for each shift. Special samples are taken as necessary to provide information on coal quality. At regular intervals, duplicate samples are sent to Commercial Testing Co. for analysis, and the results are compared with those from the plant laboratory.

The Compass goal with the new cleaning plant is to provide customers with a high-quality uniform product. Completion of the plant makes the following washed sizes available from the Compass Nos. 1 and 2 plants: slack (various), nut-and-slack (various), special spreader stoker coal, pea, stoker pea, stoker, nut, and egg (various). In addition to the regular sizes, Compass makes modified slack sizes for special uses and to any degree desired by the customer.

To provide the new cleaning facilities with a steady stream of coal, Compass has a fully mechanized all-belt mine. Coal is delivered to the preparation plant over a network of belt conveyors whose total length is more than 13,000 ft. To improve the efficiency of the mine and increase output, two continuous miners have been added. Backing up the continuous miners is other equipment including Joy 11-BU loaders, shuttle cars, universal cutting machines and special roof-bolting units.



FAST 7-MI MOVE of 560-ton 13½-yd dragline was achieved in 7 days with aid of two 315-kw mobile generator sets. Saxton Coal Corp. negotiated all easements with property owners before move began.

Mobile Power Units Cut Cost of

Estimated savings of $15,000 and 24 fewer moving days are top benefits from using mobile generator sets to supply power for 7-mi move.

MOVING a 560-ton Marion 7400 walking dragline 7 mi with mobile power has recently been completed by the Saxton Coal Corp., Petersburg, Ind. It is believed to be the first time a dragline of this size has been moved that far with this type of power in only 7 days.

Initial planning for the huge undertaking began over 1½ yr ago. Many details were considered, including selecting the best route, the approximate date and the all-important question of what kind of power to use.

A power source was needed to provide enough energy for the dragline to walk and also to make some of its own cuts. Three methods of moving the unit were possible:

1. The unit could be disassembled and then reassembled at the new site. This would cost approximately $60,000 and take 3 mo.

2. Utility power could be used, which meant erecting power lines, taking them down and erecting them again. This method would cost about $45,000 and consume some 30 days.

3. Mobile power could be used, which would cost about $30,000 and take less time.

PLANNING THE MOVE

About a year ago executives from Saxton were attending a meeting of the Open Pit Mining Association in Hibbing, Minn. During this time a Caterpillar mobile electric set, powered by a Caterpillar D397 engine and capable of delivering 315 kw, was on display in the downtown area. Bernard Youngs, Saxton vice president, and Darwin Youngs, general manager, inquired about the possibility of using this set for the move.

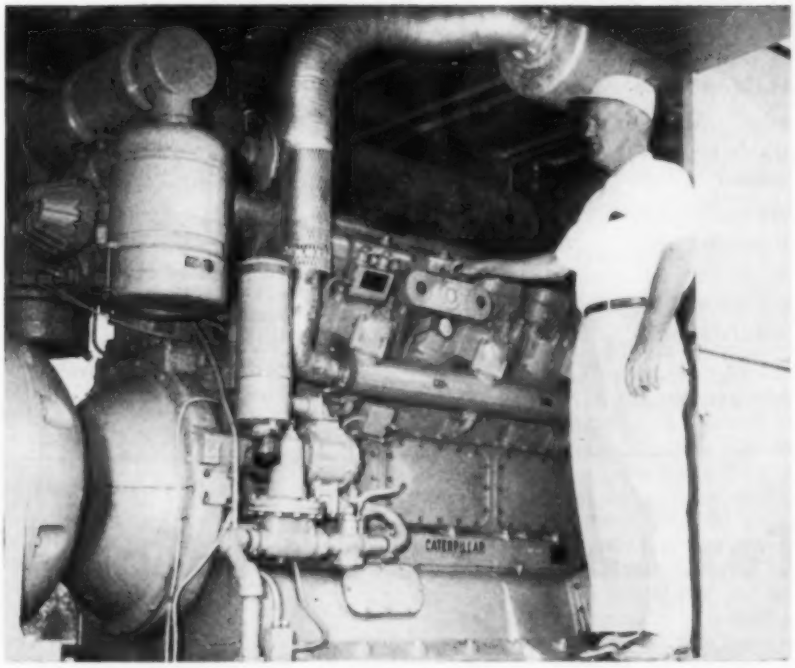
Upon returning home further negotiations were carried out with Caterpillar, and a tentative date for the move was arranged. It was also agreed that the second unit was necessary and that it also should be a D397 to reduce complications. This set was located and rented from Geo. M. Brewster & Son, Inc., Bogota, N. J., making a total of 630 kw available for moving.

After the mobile electric units were arranged for, right-of-way easements across private property had to be negotiated. Working permits also were acquired for the railroad and power-line crossings. It took 6 mo to get these.

Payments for easements across private property were arranged on a per acre basis. Crop damage was considered as a separate item and was paid for after the dragline crossed the property. Usually a 100-ft swath was used for the passage. Damage to fences was handled in two ways. Either the farmer would repair his own fence, keep records of his time and materials for reimbursement or a temporary fence would be set up and a permanent one erected after the dragline had reached its destination. The farmer usually selected the second course.

WHAT THE OBSTACLES WERE

With the preparation completed, the dragline was ready to be walked from the old area near Somerville, Ind., to Oakland City. The first obstacle was a 69,000-v power line owned by the Southern Indiana Gas & Electric Co. This line could be crossed only on Sunday because no alternate



SAXTON PRESIDENT Kenneth Youngs inspects one of the two mobile sets that supplied 630 kw to the dragline while in transit.

Long Dragline Move

line that could handle the existing week-day load was available. After this crossing, only a short distance was covered before State Highway 57 was encountered.

For the highway crossings, assistance was received from the state highway patrol and all traffic was detoured. To protect the asphalt road, the dragline heaped 5 ft of dirt on it. Then two Caterpillar D7 tractors dressed up the dirt and the immediate approaches.

A second state highway, No. 64, was crossed similarly. All asphalt roads received a protective covering. Gravel roads, however, were crossed by building approaches only.

For crossing railroad tracks, rails and ties were removed. It was necessary to remove two rails and the ties under them from each track. This work was done by the respective railroad companies. The New York Central was crossed at two different places and the Algiers, Winslow & Western R. R. was crossed once. To cross these roads after the rails and ties were removed, no protective covering was used. However, approaches were built by the dragline and the D7 tractors.

Power lines were taken down by the power company crews. All the lines carried 33,000 v except one that carried 69,000.

A total of seven roads, five power lines and three railroads were crossed. Only labor charges were levied by the owners.

WALKING THE DRAGLINE

One thousand feet of power cable was used to walk the dragline. This permitted the unit to travel 2,000 ft before the mobile electric sets had to be unhooked and moved 1,000 ft ahead of the dragline.

Whenever possible the dragline worked around the clock. However, when highways, railroads or power lines were reached, night travel ceased. To handle this round-the-clock operation took three 6-man crews. This did not include the Caterpillar personnel which had charge of the electric sets or the supervisory personnel of Saxton.

Tests conducted on surrounding bottom land showed that no solid footing existed in some areas down to 75 ft. The top layer rested on sand or muck and in one spot the sod started to ball up in front of the dragline tub. It took about 1 hr to cross this spot with the help of the D7. In similar areas that followed the sod was removed to prevent a recurrence. There was always the danger in areas such as this that the dragline would sink.

Crossing the South Fork of the Patoka River presented the greatest potential risk. This river is about 50 ft wide and 12 ft deep. Although the flow is not great there was the threat of a heavy rain turning the river into a torrent.

Instead of laying tubes in the stream bottom, a diversion canal was built to bypass the water. To permit the dragline to cross, approximately 3,000 cu yd of dirt was dug by the unit when it arrived at the river. The crossing was not prepared previously because the fill had to be kept as dry as possible. Despite this precaution, the tub sank into the fill as much as a foot. If trouble had been experienced at this spot the journey would probably have ceased and the disassembling job begun.

After crossing the Patoka the dragline dug out the channel. In the meanwhile the D7's were clearing the land ahead and skimming the top soil from the soft bottom land.

The dragline bucket was useful not only for digging but also for a counterweight. When traversing soft spots or hills the bucket was lowered and permitted to dig itself into the earth. This greatly improved the unit's stability.

Several times the route passed over water lines. It also passed over the Little- and Big-Inch pipelines. Before passing over these lines, a protective cover of earth was laid over the area, the depth of fill varying according to the depth of the lines.

To maintain friendly relations with the landowners along the route a second D7 with dozer and a Bucyrus Erie 15B dragline were rented to restore the damaged terrain. In many instances, farmers' lands were improved. The extra dozer was used to clear land ahead of the dragline.

Good weather prevailed throughout the journey and only minor troubles occurred. Considering the length of the route and the hazards, the operation went well. At the end, Bernard Youngs, Saxton vice president, concluded that "Mobile power is the only way to move one of these machines." The mobile sets supplied adequate power for the dragline. While walking the peak load was 560 kw; digging, 600 kw. More power was required when the unit traveled downhill since it had to be lifted against the grade in such operation. Voltage at the electric sets never dropped more than 5% during the peak loads, not including the line loss in 1,000 ft of power cable.

Check These Points Before Figuring Your Next Tax Return:

1. What is meant by "percentage depletion" and when should it be used instead of "cost depletion" in figuring property depreciation?

2. What two new methods are available for computing depreciation on mine improvements?

3. What are the advantages and disadvantages of combining separate operating or nonoperating (royalty) mineral interests?

4. When does the Internal Revenue Code of 1954 permit combining of geographically separated mineral interests?

5. When can a mine operator deduct percentage depletion on mine wastes?

6. When should a deduction for mine exploration expenditures be passed over one year and carried to another?

7. What changes in the 1954 tax code affect the treatment of capital gains on royalties?

8. What trends in interpretation are indicated by recent court decisions on tax treatment of backfill costs, "economic interest," and property evaluation?

The answers to the above questions, given by Mr. Wood in this article, may lighten the burden of solving your complex and special income tax problems. They may also help you cut your tax bill in the future.

How New Tax Laws Benefit Coal

A specialist on coal mining taxation looks at the Internal Revenue Code of 1954 and finds cost-cutting advantages in new methods of taxing coal income.

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THE FIELD OF FEDERAL INCOME TAXATION is constantly undergoing change. New laws, court decisions, and administrative rulings require continual study by a coal operator or his tax advisor so that full advantage can be taken of every opportunity to keep the burden of taxation at the lowest possible level. Certain recent developments in income taxation are of interest to the coal industry. Particularly important is the Internal Revenue Code of 1954, containing changes in the methods of taxing coal income. The most pertinent are discussed below.

Percentage Depletion

Origin—Percentage depletion is by no means a recent development, but it is difficult to discuss the taxation of natural resources without first going back for a review of this very important subject. Usually the coal producer has a monetary investment in his mineral contents. As he removes the mineral from the ground his investment is reduced. This is similar to the owner of a machine who gradually loses his investment in the machine as it is used and wears out. The machine owner is allowed an annual tax deduction for depreciation to compensate for the exhaustion of his asset. Likewise, the coal producer is entitled to an annual tax deduction to compensate for the wasting of his investment in the mineral content. The annual deduction, or "cost depletion," is allowed, generally on a per ton basis, until the total investment is recovered as a tax deduction. In summary, cost depletion is a form of depreciation of an asset.

Definition – Percentage depletion, which may be taken as a tax deduction instead of cost depletion, involves an entirely different concept. In simplest terms, percentage depletion is a tax deduction computed as a percentage of gross income from the mining operation (10% in the case of coal) and limited to 50% of the taxable income from the mining operation. The coal producer will figure the percentage depletion both ways and take whichever answer is smaller to use as a tax deduction in place of his allowance for cost depletion. The cost depletion figure will be used, however, if it results in a larger tax deduction than percentage depletion.

Lifetime Deduction—One important feature of percentage depletion is that the aggregate deduction over the life of the property is not limited to the investment in the mineral content. The tax deduction is allowed as long as coal is extracted from the property and it produces a net income. On the other hand, cost depletion is not allowed after the investment has been recovered by way of tax deductions. Percentage depletion may give the owner a portion of tax-free income long after his investment is recovered.

The following example illustrates the advantage of percentage depletion:

Gross income from mining property	$100,000
Costs of mining	86,000
Taxable income from mining property	$14,000
Cost depletion—recovering the mineral investment on a per ton basis—assuming 1c per ton for 25,000 tons	$250

In this case, the owner has percentage depletion of 10% of $100,000, or 50% of $14,000, whichever is lower. He is thus entitled to percentage depletion of $7,000. This figure is more advantageous than his cost depletion of $250 and so he takes a tax deduction for the higher amount. Basically, "gross income" means the amount for which the coal is sold, less the rents and royalties paid by the producer on the property. Generally speaking "taxable income" is the gross income from the property less the direct and indirect costs of mining the coal. Taxable income is computed without a deduction for depletion.

1954 Tax Code Changes

Mine Improvements—It is common practice for the coal producer to depreciate mine improvements by the unit of production method or the straight-line method. Under the Internal Revenue Code of 1954, which was enacted Aug. 16, 1954, mine improvements may be depreciated for the first time by two additional methods. The new alternatives are referred to as the "double declining balance" and "sum-of-the-years' digits" methods. Since the new methods result in greater deductions for depreciation during the early years of life of an asset, the coal producer should review the methods for possible tax advantages.

Aggregating Operating Interests—In percentage depletion, the deduction is computed as a percentage of gross income or of taxable income from the property. The term "property" was not defined in the tax law before 1954. However, in the regulations published by the Commissioner of Internal Revenue, the term "property" was defined as a taxpayer's interest in each separate mineral property. The new tax law defines the term as "each separate interest owned by the taxpayer in each mineral deposit in each separate tract or parcel of land." This definition conforms generally with the definition contained in the regulations under the old law. Percentage depletion must be computed separately on each property as that term is defined under the new law.

Under the old law, the commissioner permitted two or more mineral properties to be considered a single "property" provided the mineral properties were included in a single tract or parcel of land and provided such treatment was consistently followed. Under the new tax law, a coal producer may elect to aggregate two or more separate operating mineral interests which constitute all or a part of an operating unit. There are two advantages to aggregating mineral properties:

1. It will eliminate the great deal of record keeping which is required to compute gross income and mining costs for each separate property. This advantage has no offsetting disadvantage tax-wise.

2. It may result in a greater allowance for depletion. This advantage is demonstrated by the following illustration. Assume that "X" owns a parcel of land containing two separate seams of coal. He operates one mine for both seams.

	Seam A	Seam B	Totals
Gross income	$200,000	$100,000	$300,000
Mining costs	150,000	88,000	238,000
Taxable income	50,000	12,000	62,000
10% of gross income	20,000	10,000	30,000
50% of taxable income	25,000	6,000	31,000

If "X" computes depletion on Seams A and B separately, he will be entitled to $20,000 for Seam A, the lesser of $20,000 or $25,000, and $6,000 depletion on Seam B, the lesser of 10% of gross income or 50% of taxable income. If "X" elects to aggregate Seams A and B, he will be entitled to a deduction for $30,000, this amount being less than 50% of the combined taxable income. By aggregating, operator "X" gains a tax advantage of $4,000.

The major disadvantage in aggregating mineral properties stems from the fact that once an election to combine is made, the aggregation must be maintained for all future years unless permission is received from the Internal Revenue Service to unravel the combination. This "binding election" feature should cause the taxpayer to think of the future before electing to aggregate his properties.

Here is what can happen. In the above example, assume that Seam B becomes a loss operation. In a subsequent year, the depletion set-up of "X" might then look like this:

	Seam A	Seam B	Totals
Gross income	$200,000	$100,000	$300,000
Mining costs	150,000	136,000	286,000
Taxable income	50,000	36,000	14,000
10% of gross income	20,000	10,000	30,000
50% of taxable income	25,000	.....	25,000

Operator "X" has previously elected to aggregate his properties so he is now entitled to percentage depletion in the amount on 50% of his combined taxable income of $14,000 or $7,000 (the $7,000 being less than 10% of gross income or $30,000). If "X" had not previously elected to aggregate, he would have been allowed depletion of $20,000 on Seam A and zero depletion on Seam B. His loss on depletion amounts to $13,000 for this year.

Another disadvantage is that the aggregated properties are considered one property for all income-tax purposes. As a result, if one of the properties becomes worthless, the taxpayer may have difficulty in proving a loss because he is unable to allocate his depletion reserve between the properties.

When aggregating two or more separate operating mineral interests as part of an operating unit, there are several important points to remember:

1. The taxpayer can combine only operating mineral interests, that is, an interest in which the taxpayer has the right to mine coal.

2. The combination has to be within an operating unit. Unfortunately the law does not define an operating unit. It is hoped, however, that a practical approach will be taken so that interests will be considered operating units when they can be conveniently and economically operated together. This can be determined after considering geographical location, organization and supervision of personnel, equipment, and storage and disposal of the coal. In aggregating mineral properties for percentage depletion under the old law, properties geographically separated could not be combined for percentage depletion. Under the new law, geographically separated properties can be combined if they are within the same operating unit. This may be an advantage, for example, to truck miners who are working in several separated areas but handling the total operation as a single operating unit.

3. There can be only one combination within an operating unit. If any property is not combined, percentage depletion must be separately computed for that property.

As one example of how aggregation works, Taxpayer "A" owns a tract of land under which there are three separate seams of coal. He mines coal from all three seams and maintains one operating unit. Under the general rule he has to compute depletion for each seam. He elects to aggregate the three properties into one and so he makes only one computation of depletion.

As another example, Taxpayer "B" mines coal on six separate tracts of land which he operates as one mine. Under the general rule he has six separate properties and one working unit. He elects to combine five of the properties. He then makes one computation of depletion for the five combined and an additional computation for the one not combined. At a later date he adds a seventh parcel of land to the operating unit. He elects to add this parcel to the previous combination of five.

The election to aggregate existing properties was to have been made with the tax return for the first taxable year beginning after Dec. 31, 1953. For future acquisitions, an election can be made in the year during

which expenditures for exploration, development or operation are first incurred with the new operating interest.

At this writing the commissioner has not issued his regulations interpreting the new law as it relates to aggregation of properties. It is hoped that these regulations will contain a definition of an operating unit. In the absence of regulations, the Treasury Department has ruled that if a taxpayer must file a return before the last day of the third month after the month regulations are published, he may change treatment of an elected interest, provided an amended return is filed by the last day of the third month.

Aggregating Royalty Interests—The owner of nonoperating, or royalty, mineral interests may combine such interests if he can demonstrate to the Commissioner of Internal Revenue that an undue hardship is avoided by the aggregation. Here again, once the combination is set up, it cannot be changed without the permission of the commissioner. In addition, all royalty interests must be located in a single tract of land or in two or more tracts with common boundaries.

An example of an undue hardship which might qualify is where the property bases of two royalty interests cannot be separated for purposes of computing cost depletion.

Mine Waste—For the first time, the 1954 code permits a mine operator to take a deduction for percentage depletion when waste dumps are reworked. This permission is granted only to the operator who created the waste dump.

Mine Exploration—The tax law permits a taxpayer to deduct mine exploration expenditures which are incurred before the development stage of the mine is reached. Such expenditures include those made to determine the existence, location, extent or quality of coal. Under the old law, the annual deduction was limited to $75,000 for each taxpayer. Under the new law, the annual deduction is increased to $100,000. Any excess over the $100,000 is considered an ordinary investment in the property to be recovered through cost depletion. Also the annual deduction can be taken only for 4 yr, after which expenditures are to be capitalized as ordinary investments. Instead of deducting the exploration expenditures, a taxpayer may elect to capitalize and recover them on a "per-ton" basis as the coal is mined.

Since the deduction is allowed only for 4 yr regardless of whether the full $100,000 is taken each year, the coal operator might find it advantageous to pass over the deduction in a year of small expenditures to take advantage of a higher deduction in a later year. Consider the case of "Y" who has exploration expenses as follows:

1954	$85,000
1955	100,000
1956	90,000
1957	15,000
1958	100,000
Total	$390,000

If "Y" deducts his exploration costs for the first 4 yr, he will get a total tax deduction of $290,000 plus a capital investment of $100,000. If "Y" deducts his costs for 1954, 1955, 1956 and 1958, he will get a tax deduction of $375,000 plus a capital investment of $15,000. While theoretically his capital investment will eventually result in a tax deduction through cost depletion, as a practical matter, the deduction for cost depletion will probably be eliminated by percentage depletion and thereby lost. In all probability, the result of this tax planning will be an additional tax deduction of $85,000.

Capital Gain on Royalties—Under certain conditions, a person who receives royalty income from coal, and retains an "economic interest" in the coal, is permitted to treat the royalty income as capital gain, thereby subjecting that income to a tax rate no greater than 25%. An "economic interest" is present when the taxpayer must look solely to the coal for capital or profit return. Such would be the case where a coal owner leases the coal to an operator and the owner is to receive a royalty based on tons of coal produced. One condition to be met is the royalty owner must have held the coal more than 6 mo before disposal. Another is that the royalty owner must not be a partner, principal, or coadventurer in producing the coal. A third condition is that the capital gain must be measured by the excess of the amount received over the pro-rata portion of the taxpayer's tax basis in the property.

This liberal tax treatment was permissible under the old tax law, but two changes were made by the new law:

1. The capital gains treatment was extended to the sublessor of the coal provided he retains an economic interest in the coal.

2. The capital gain is reduced for costs incurred in making the contract under which the disposal took place and costs incurred in maintaining the economic interest. Under prior law, these costs generally were taken as ordinary deductions thereby maintaining the maximum tax advantage. Congress intended this provision to cover such expenses as state and local taxes, insurance costs, bookkeeping and technical supervision costs incurred in the administration of the contract, flood control, legal fees, and costs of measuring quantities of coal disposed of under the contract.

Precedents

Backfill Costs—When a strip miner strips coal from the ground, he is generally burdened with some obligation to conduct backfill operations. The obligation may stem from his contract or lease, or from state law. His backfill costs are an operational expense and so are a tax deduction. The cash-basis taxpayer has little problem for he takes the tax deduction when he pays the expenses of backfilling. The accrual-basis taxpayer has the problem of deciding whether he should take the deduction in the year the coal is removed, or in the subsequent year that backfilling is done.

A number of taxpayers have contended in court that they should be allowed to deduct a reserve for backfill costs simultaneously with the stripping of the coal. Taxpayers have lost these cases primarily because the backfill costs deducted were estimated unreasonably. In a recent case, the Tax Court of the United States pointed out that to have any degree of success in getting a deduction, the estimate of backfill costs must be made with reasonable accuracy. To make a reasonable estimate, a strip miner must consider such things as the depth of the overburden to be replaced, the distance it is to be moved, drainage, planting, cost of labor, and the availability of machinery. Deducting a flat rate per ton of coal removed, based on a sheer guess, will not get much consideration from the courts. On the basis of recent cases, however, it appears that an accrual taxpayer might obtain the deduction if he has a reasonable basis for his estimate.

"Economic Interest"—Any taxpayer who has an "economic interest" in a coal deposit is entitled to percentage depletion, except the royalty owner who gets capital gains treatment on his royalties.

The strip mine contractor must decide when he has the economic interest necessary to permit the deduc-

tion for percentage depletion. In 1950 the Treasury Department ruled that coal stripping contractors would be allowed a depletion deduction where the following conditions were met:

1. The contract may not be terminated at will or upon nominal notice.

2. The contractor must look to the extraction and sale of the coal for his compensation.

In a recent case, *Paul E. Barry, Inc.*, TCM 1955-12, Barry was given the right by Comfort to strip tracts of lands. Comfort had the right to purchase all of the coal from Barry before it could be offered to anyone else. Barry sold the coal to Comfort at a negotiated price. The cost of backfilling was borne by Barry. The court held that Barry had an economic interest and was therefore entitled to depletion. The fact that Barry had to sell its coal to Comfort apparently did not disturb the court because the sales price was not a predetermined amount. This conclusion follows the thinking of the Court of Appeals for the Fourth Circuit which allowed depletion to a stripper where his compensation was a fixed price per ton subject to adjustment for changes in market price, even though the operator retained the right to make the sales (*Commissioner* v. *Gregory Run Coal Co.*, 212 F, 2d, 52).

Compared to the Barry case, in *Hamill Coal Corp.*, TCM-1955-68, the stripping contractor had no economic interest because the lessee supervised the contractor to the extent that the contractor appeared to be an agent. In addition, the contractor received a flat amount per ton at the tipple, which amount had no relation to market value.

In *Mammoth Coal Co.*, 22 T. C. No. 73, the stripping contractor did not get depletion because he was to receive a stated amount per ton mined and the payment was made irrespective of whether the lessee sold the coal.

The recent court cases on this subject have emphasized the fact that the coal stripper has an economic interest in the coal only if he relies on the extraction and sale of the coal for his compensation. If he is compensated by the lessee at a flat rate per ton without reference to the fair value of the coal, then in all probability he will be regarded as an agent of the lessee working without risk.

Zero Property Basis—Gain or loss on the sale of a mineral property is measured by the difference between the tax basis of the property and the proceeds. Allowances for depletion, whether cost or percentage, reduce the tax basis of the property. Percentage depletion usually exceeds the tax basis. In Revenue Ruling 54-421, the Treasury Department pointed out that the tax basis of the property can never be less than zero, even if allowances for percentage depletion are far in excess of the basis. The ruling, however, says that the excess of depletion over the basis must serve to reduce the basis of any subsequent depletable capital additions to the property.

Evaluating Property—In a recent case, *Pool* v. *U. S.*, 119 F. Supp. 202, a taxpayer deducted a worthless mineral (oil) property in the year that an oil company concluded that there was no oil on the property. The commissioner attempted to disallow the loss on the grounds that mineral interest is a part of the total land ownership and no loss occurs until the land itself has no value. The court allowed the loss because, under Texas law at least, the mineral rights may be valued separately from the surface rights. While this contention has not been made by the commissioner in the field of coal mining, it might be borne in mind by the coal man who abandons a mineral interest but retains the surface land.

How a Fine Water Spray Puts Out Fire

ABOUT 300 MICRONS (0.012 in) is the optimum average diameter of water droplets in fine sprays intended for fire-fighting, according to a report of tests conducted at Underwriters' Laboratories, Inc., for the National Board of Fire Underwriters. Finer droplets may not have sufficient energy to penetrate the turbulent currents of hot gases, and thus would be carried away from the fire, while larger droplets would evaporate more slowly and have less cooling effect.

Many successful applications of water sprays in putting out fires have been reported to the board, but data on the fundamental processes involved in extinguishment and the factors which influence it were meager. Therefore, the tests were conducted in order that this method of attacking fires may be employed to greatest advantage and its limitations understood.

The tests show that extinguishment is due primarily to the smothering effects of the water vapor produced by evaporation of the droplets. Elimination of all oxygen generally is not necessary in putting out a fire. Flaming combustion of most common materials can no longer continue after oxygen is reduced to 12 to 15% by volume.

Fires can be put out by diluting the oxygen content of the surrounding air with an inert gas or vapor. Carbon dioxide and nitrogen are commonly used for this purpose as are the various vaporizing extinguishing agents.

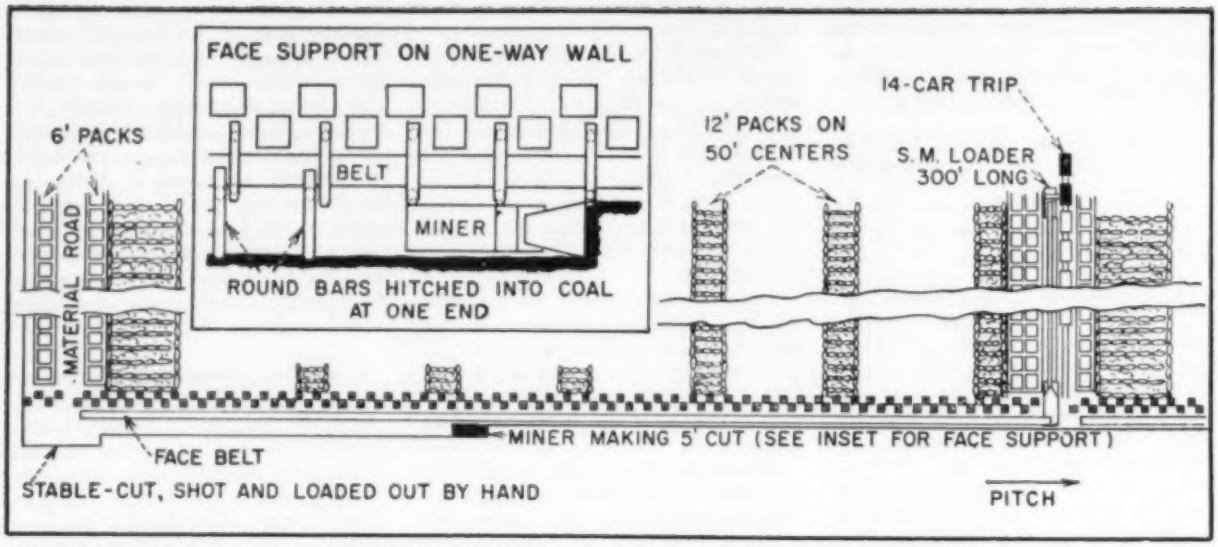
Similarly, water vapor or steam may be used under appropriate conditions to dilute the oxygen in the atmosphere. And a fine spray is an excellent source of water vapor in a form most readily converted into steam by the heat of the fire.

In addition to its smothering effect (lowering the oxygen content of the air), the water vapor also has a cooling effect, since it absorbs heat in evaporating. The total cooling effect in any given quantity of water is directly proportional to the surface area presented by that water to the evaporating forces, maximum surface area being presented when the water is finely divided, as in a spray. However, if the droplets are too small they may be lifted out of the effective fire-fighting zone, as previously mentioned.

A third fire-control measure is removal of the fuel, although this is the least promising measure except in cases where a valve may be closed in a burning gas line, for example. But some water droplets from a spray may filter down through the fire to the unburned fuel, cooling it to a temperature below its point of ignition. This effect is out in gasoline fires, though, since even ice is warmer than the flash point of gasoline. In such fires, the fine spray is useful because of its oxygen-dilution and evaporation-cooling effects.

Size of water droplets produced by some spray nozzles is a known quantity. It pays to ask about this when buying such nozzles.

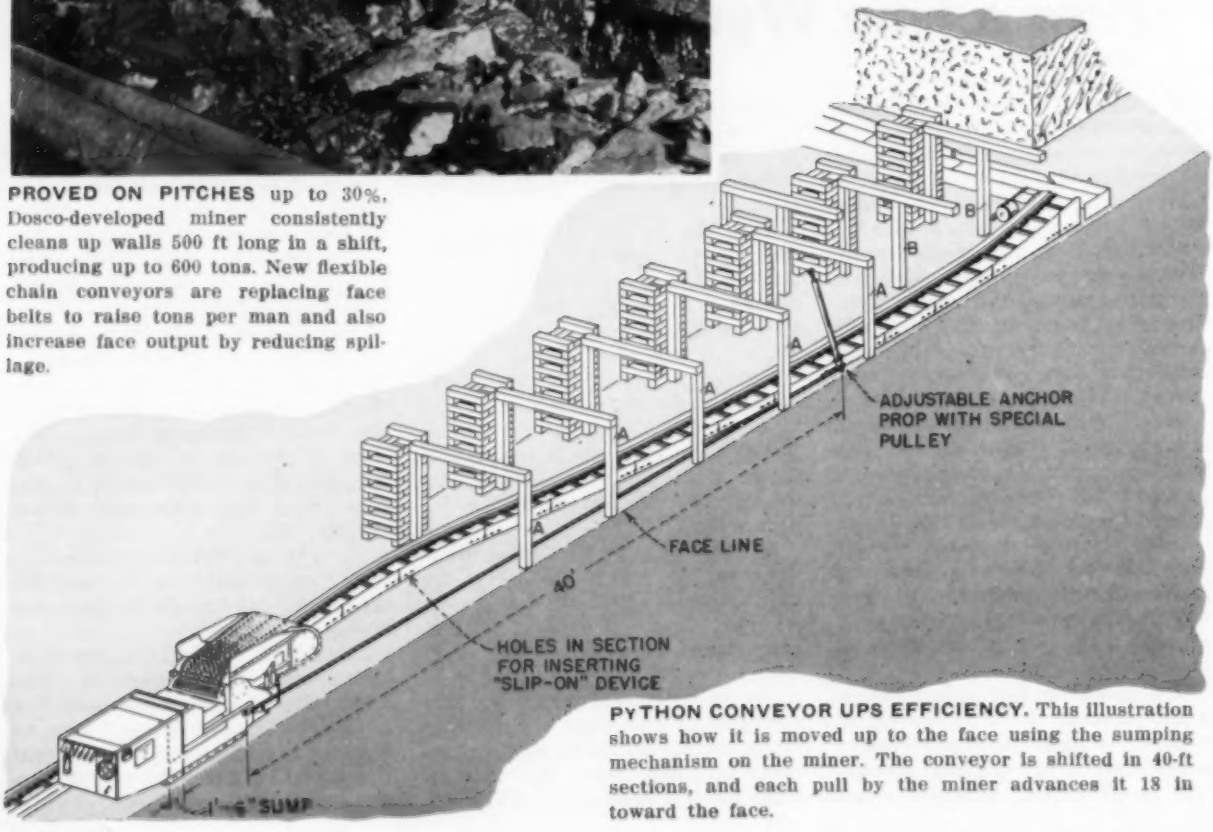
Copies of the full Underwriters' Laboratories report, entitled **"The Mechanism of Extinguishment of Fire by Finely Divided Water,"** may be obtained from **Research Div., National Board of Fire Underwriters, 85 John St., New York 38, N. Y.**



LONGWALL PLAN utilizes specially designed continuous miner. In this version, where pitch limits cutting to downhill only, bars behind the miner are hitched into the face. General support is provided by packwalls, chocks and bars.

PROVED ON PITCHES up to 30%, Dosco-developed miner consistently cleans up walls 500 ft long in a shift, producing up to 600 tons. New flexible chain conveyors are replacing face belts to raise tons per man and also increase face output by reducing spillage.

Teaming up British-built flexible conveyor with Canadian-developed Dosco miner jumps longwall efficiency and raises coal recovery.



PYTHON CONVEYOR UPS EFFICIENCY. This illustration shows how it is moved up to the face using the sumping mechanism on the miner. The conveyor is shifted in 40-ft sections, and each pull by the miner advances it 18 in toward the face.

Snaking Conveyor Ups Longwall Tons per Man

THE PYTHON CONVEYOR is the latest device to be called upon by the Dominion Coal Co., Ltd., of Sydney, N. S., in its campaign to reduce coal-production costs and raise coal quality. Up to the end of 1954, this program had included the installation of 18 Dosco miners, bringing the mechanized output of the company up to 41.7% of the total.

The program is still to be completed. For example, a new central washing plant with a capacity of 20,000 tons per day of two shifts will be started in the fall of 1955, materially extending the benefits achieved from an earlier plant, now 3 yr old, with a capacity of 6,000 tons in two shifts. A new 3,800-ft slope with a cable-belt conveyor will cap haulage improvements at one group of collieries, including new aluminum cars which, with diesel locomotives, already have made their mark at other of the company's properties. And, of course, additional Dosco miners will be put to work as places can be developed for their use. Two more, for example, will go into Dosco collieries in 1955, and possibly four in 1956.

DESIGN FOR LONGWALL

Heavy cover, much of it over 1,500 ft and still increasing because mining is following down the dip and out under the sea in the Cape Breton collieries—the company's major producers—makes longwall a necessity, while pitches up to more than 18 or 20 deg in many places pose a real problem in mechanical production. Dosco's answer, for work up to 30%, was the development of the Dosco miner, manufactured by an associate company, Trenton Industries, Ltd., Trenton, N. S.

The Dosco miner was especially designed for longwall mining, with characteristics and capacity to permit operation on pitches up to approximately 30%. On light pitches, it cuts both ways; on heavy, downpitch only, being trammed back for the next cut.

The ripper-type head makes a cut 57½ in wide and 18 in deep. The cycle is: drop head, sump 18 in, raise head to desired top limit. The coal is passed back by the chains to a transverse belt, which discharges it sideways to a conveyor laid along the face for its full length—usually around 500 ft, but sometimes less and occasionally more up to 630 ft. Most walls average about 1 ton per foot. Normally, however, length does not much exceed 500 ft, which a miner normally can cut completely in a shift. This is necessary because advancement of conveyor, timber and packwalls must be done on the offshift, and failure to complete the cut would mean loss of a day in the cycle.

PYTHON DEVELOPMENT

After some initial experiments, the belt conveyor was adopted as the face transportation unit. High capacity enabled the belt to keep pace with other machine and operating improvements, with the result that in 1954 the average output of all Dosco miners was 6,570 tons per month, rising to 7,000 tons per month in April, May and June, 1955. In addition, one unit, up to July 7 had mined 170 consecutive cuts without a miss, producing a total of 84,000 tons.

Advancement of the belt, however, required a substantial outlay for labor, and consequently generated a search for a unit that could be moved with a minimum of cost. It was found in the Huwood P-80 "Python" conveyor—a double-chain and flight unit designed to be bent in moving and, if necessary, in operation. In other words, it is a flexible chain conveyor 22 in wide and 500 ft long with 50-hp fluid drives on both ends. With back skirt plates increased from 7 to 12 in in height, the conveyor can take surges of 10 tpm, with a steady-rate capacity of 4 to 4½ tpm. It was installed on a wall pitching 14 deg in No. 12 colliery, New Waterford, N. S.

MACHINE MOVING

Now, compared to moving the belt conveyors by hand, the "Python" is moved by the miner as it trams back up the wall on the off-shift. The system is shown in the accompanying drawing, and involved the development of special anchor props with conical pulleys at the bottom. The conveyor is moved in 40-ft sections as follows:

1. Set anchor jack against face.
2. Attach "slip-on" device to section. Slots with round centers permit a button made of a heavy rivet head to be quickly inserted and removed to attach or detach device.
3. Place rope already attached to miner around pulley and attach to "slip-on" device.
4. Tram miner with head out to tighten rope.
5. Retract head on miner 18 in, which pulls conveyor over 18 in. Repeat by sumping out head, moving miner on crawlers and retracting head until conveyor is pulled to the face.
6. Release rope and "slip-on" device.
7. Tram machine 40 ft up pitch and repeat.
8. Move face props (Position A) to gob side of conveyor (Position B).

Short lengths of rail placed under the conveyor ease the operation.

MORE TONS PER MAN

Using the miner, normal time required to pull the conveyor over the full length of the 500-ft wall is approximately 2½ hr. The mechanics and face-timbering crew normally required handle the job. As a result, some 6 to 8 men are released from conveyor moving for other productive work. This is reflected in a substantial increase in performance.

Daily output on the "Python" wall, for example, averaged 580 tons in one check period, an increase of 30 to 40 tons over the output before the new unit was installed. This unexpected by-product resulted from the fact that spillage is much less with the "Python" unit. Tons per man to the transfer point, mining shift only, averaged 49.33, and tons per man to the railroad car 3.6. In comparison, performance with a neighboring belt unit was 40.8 tons per man to the transfer point, and 2.70 to the car.

In view of the initial showing, all miner walls will be equipped with "Python" conveyors as quickly as the changeovers can be conveniently and economically made. New units will be equipped with special devices worked out for Cape Breton conditions by Dosco operating men and engineers. One such device is a telescopic section for use at the head and tail ends.

Telescopic sections are required because all walls are not at right angles to the roadways, and consequently the discharge end of the face unit moves toward or away from the belt car loader in the roadway as the face advances. The Dosco-developed telescopic sections feature short ratchet screws and boxes that can be quickly inserted into or removed from slots in the pan sides. Thus, quick extension or retraction is possible without long ratchet screws and accompanying complications. Length of a telescopic section is 5 ft, and two or more may be used together to lengthen the interval between the transfer of a regular pan for a new start.

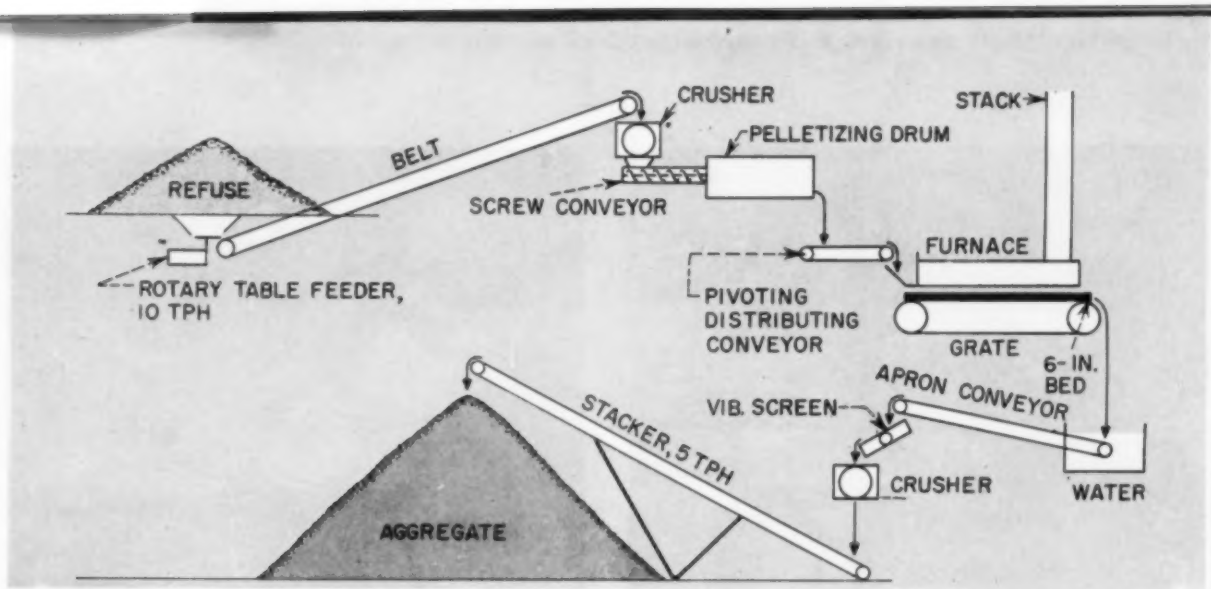
MATERIAL SOURCE Washery refuse accumulated in settling ponds and presently totalling 1,500,000 tons provides the raw material for Trulite aggregate. Size is ½x0, and reclaiming is done by scraper pulling to a recovery tunnel and belt feeding the processing plant.

PROCESSING PLANT Trulite plant is built on refuse heap 2,500 ft from the Ceredo washing plant in the background behind the Trulite stack. The guyed mast at the right is the headpost for the scraper bringing washery refuse to the reclaiming tunnel.

Conversion Into Aggregate

Burning on chain grates after crushing converts ½x0 Ceredo washery refuse into Trulite—a new form of lightweight aggregate. Present capacity of 120 tons of aggregate per day will be increased as markets are built up.

CONVERSION into a lightweight aggregate is the solution to the refuse-disposal problem at the Ceredo (W. Va.) preparation plant of the Truax-Traer Coal Co. The conversion is accomplished by the Trulite Corp., using a process on which patent applications have been filed. When crushed and screened the aggregate meets ASTM Specifications C130-42. Blocks made with the aggregate are lighter in color and lighter in weight than cinder blocks, and Trulite also notes as an advantage the fact that blocks are free from any combustible,



CONVERSION PROCESS From settling pond to final storage pile, refuse is converted to lightweight aggregate by crushing, pelletizing, burning on a chain grate, quenching, screening and crushing, and stacking. Present plant capacity is 120 tons of aggregate per day.

COMPLETED PRODUCT Crushed to 3x0, Trulite aggregate is stacked in a 1,000-ton pile from which it is loaded into railroad cars or trucks by clamshell. Shipments also may be made by barge on the Ohio River. Trulite makes blocks that are lighter in both color and weight.

Answer to Refuse Problem

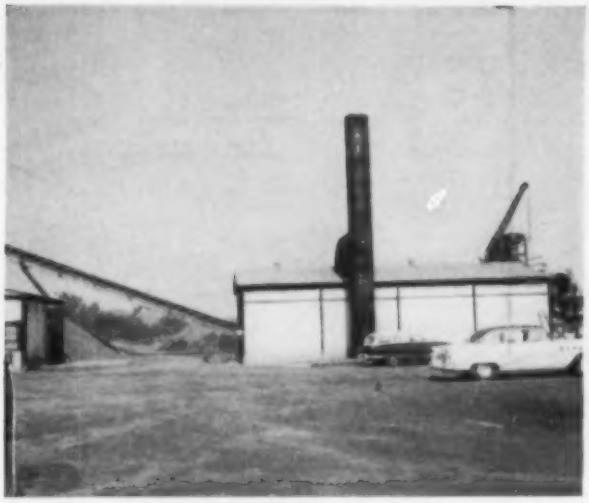
iron or other substances which might cause stains or popouts.

Construction of the Trulite plant, rated at 120 tons of aggregate per day, was started Dec. 6, 1954, and the completed plant went into operation June 1, 1955. The initial investment was approximately $120,000. The present plant, however, is in reality a pilot plant. When the market grows and the company develops a wide acceptance for the product, another furnace approximately three times the capacity of the present unit will be installed.

C. N. Howard is president of The Trulite Corp., P. O. Box 356, Ceredo, W. Va. C. A. Grace is vice president, and W. E. Parsons is secretary. Mr. Howard had been plant engineer and research engineer for the Ceredo plant of Truax-Traer which went into operation in 1949 (*Coal Age*, August 1950, p 90).

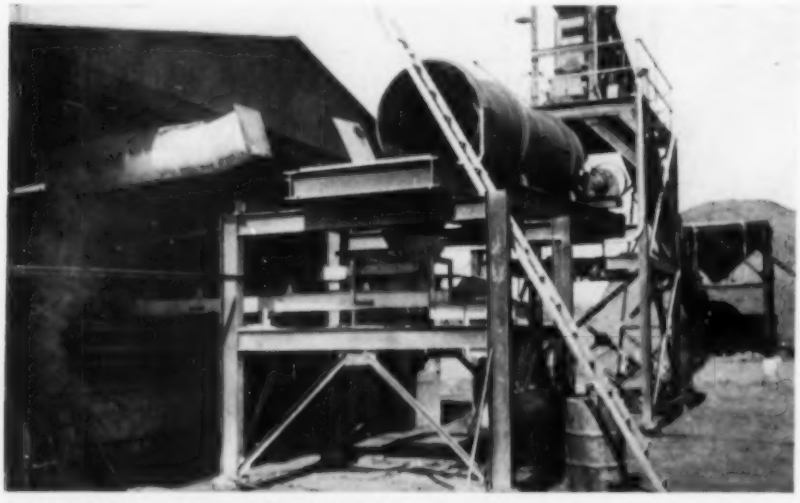
REJECT DISPOSAL THE PROBLEM

Although the Ceredo plant washes only coals of relatively low refuse content, it handles a high tonnage and is in a settled community where refuse space is limited. Disposing of the reject was not a problem when the plant was opened, but it was foreseen that it would become one in a few years. Consequently, beginning in 1949, the coal company began looking



BURNING TO FORM AGGREGATE is done in furnace building, flanked by preparation and storage facilities.

TRULITE SPARKPLUGS include C. A. Grace (left), vice president, and C. N. Howard, president.



PREPARATION EQUIPMENT includes mixing hopper over main feed belt (right), hammer mill and magnet, pelletizing drum and pivoting conveyor.

for some method of using or disposing of the waste material, which consists of ½x0 reject from wash boxes and launders. This material is pumped to the settling ponds at a rate in excess of 200,000 tons per year. It contains 40 to 50% combustible, some of it coal but most of it carbonaceous shale.

Several types of lightweight aggregate plants, including those using rotary kilns and sintering furnaces, were investigated. None was satisfactory for the high-volatile coking coal because, in the absence of oxygen, it would coke and tars would be formed. A combustion system had to be found in which the particles of coal would not be heated until they also could be ignited, and in which the volatile would be burned off immediately.

A joint research project was set up with the U. S. Bureau of Mines, Pittsburgh, where a considerable amount of the Ceredo refuse was burned on a conventional traveling grate and enough aggregate turned out so that a number of blocks could be made for test. This research proved the practicability of designing and building a plant to convert the refuse into a satisfactory aggregate.

Truax-Traer preferred not to undertake the project itself. As a result The Trulite Corp. was organized and the coal company granted a 40-yr lease on a plant site where the refuse has been piled 40 ft thick. Some 1,500,000 tons of the refuse is now available in the adjacent settling ponds.

AUTOMATICITY EMPHASIZED

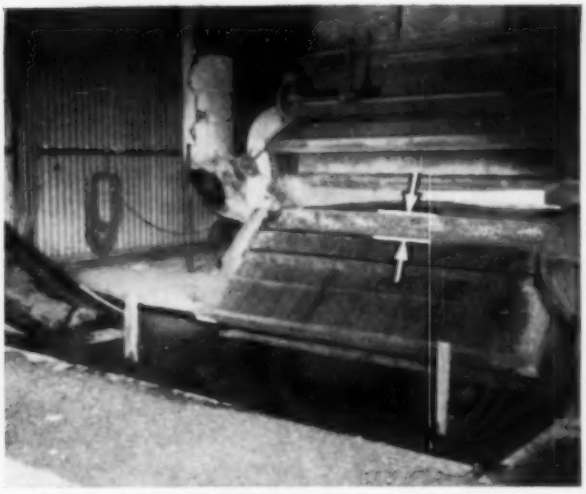
The Trulite plant was designed by the Templeton Matthews Corp. and was planned for as near automatic operation as possible. The day-shift crew consists of one operator and one clamshell man. On the other two shifts, however, a lone operator comprises the crew. Total number of employees is five and no more men will be added when the plant is expanded.

The first equipment item in the flow sequence is a Sauerman power scraper with 1½-yd bucket that pulls the ½x0 refuse from the pond to a drainage pile. An operator handles the scraper during the day. At night, however, the bucket cycles back and forth automatically from the drainage pile to a point above the recovery tunnel. The operator sets it going about once every hour and each time permits it to make 3 or 4 cycles.

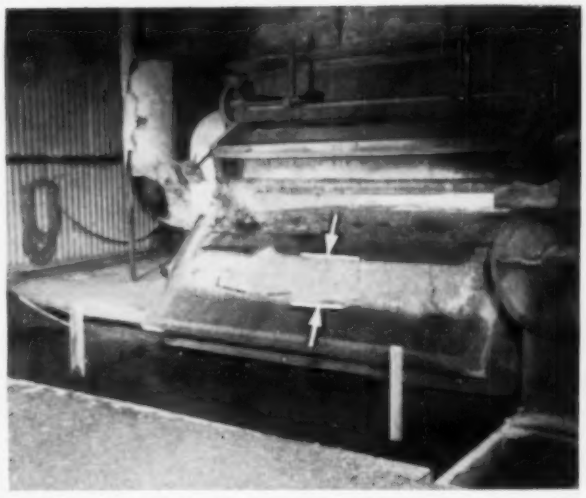
The recovery tunnel was fabricated from Armco corrugated tunnel liner. The feeder to the 14-in belt conveyor coming out of the tunnel is a 26-in rotary-table unit with plow, and has a variable-speed drive controlled from the furnace operator's booth. After passing under a tramp-iron magnet the material goes through a Williams Impactor hammer mill where it is reduced to 80% through ⅛ in. This crushing is primarily to provide a homogenous feed.

PELLETIZING AND BURNING

A 9-in-diameter screw conveyor moves the material into a pelletizing drum designed by Trulite personnel. The drum is 4½ ft in diameter and 15 ft long. It operates at 10 rpm. If the material is not wet enough water is sprayed into the drum to make it "ball up." As the material leaves the drum less than 10% will pass through a



CLINKER DISCHARGE from traveling grate, with arrows showing thickness. Final quenching is done in water tank.



CLINKER SECTION broken off layer on traveling grate drops down plate on its way to the quenching tank.

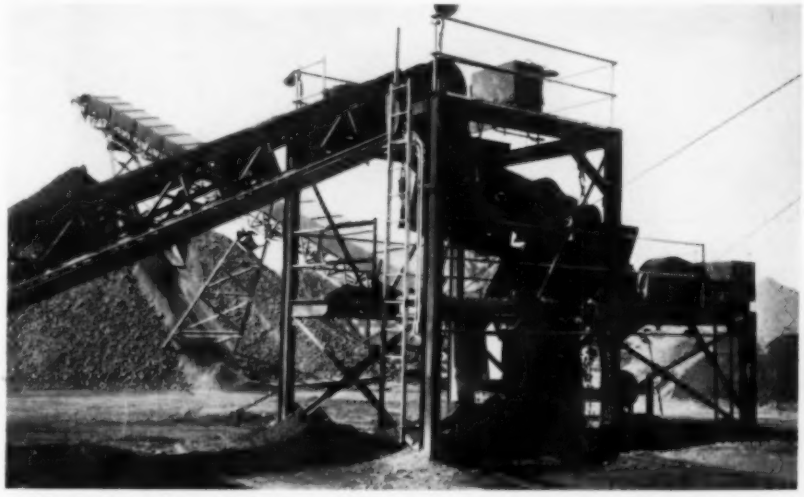
⅛-in screen. A horizontal belt conveyor pivoted at the feed end delivers to the furnace hopper. An air cylinder pivots the conveyor automatically to distribute the material evenly and prevent segregation.

The chain grate of the furnace is 10 ft wide and 35 ft long, center to center. It consists of two used 10x17-ft Combustion Engineering Coxe stokers put together. Effective grate surface is 10x30 ft. Instead of providing one large drive for the combined unit the two original drives were retained, one on the head shaft and one on the tail. They are powered by hydraulic vane-type motors supplied from a 5-hp pump, which assures equal torque on each shaft. The arrangement provides variable-speed control and also a safety factor, with the pressure-relief valve serving instead of a shear pin.

The furnace has a flat plastic arch built by A. P. Green. A 30-hp forced-draft fan supplies combustion air at a 4-in water gage to 12 separately controlled wind boxes below the grates. The fuel bed is ignited by radiant heat from the furnace surfaces. Air must be controlled carefully. It is done manually in accordance with thermometer readings.

When the material burns it forms a clinker cake about 6 in thick. A small amount of water sprayed onto the bed above the last 18 in of grate cools the cake somewhat and produces a brittleness which helps gravity break off segments of the cake as it overhangs the end of the grate. The cake is quenched and cooled in a water-filled pit at the end of the grate.

From the water an apron conveyor carries the cake up to a Gyrex 4x6-ft vibrator which shakes off any loose



FINISHED AGGREGATE from quenching pit goes to vibrating screen and crusher, and then to stacker (background) for ground storage before shipment.

or unburned material. Next the cake goes through a McNally Pittsburg 24x36-in single-roll crusher which reduces it to 3x0. A Barber-Greene stacker with an 18-in belt moves the aggregate to a 1,000-ton pile.

RAIL OR RIVER SHIPPING

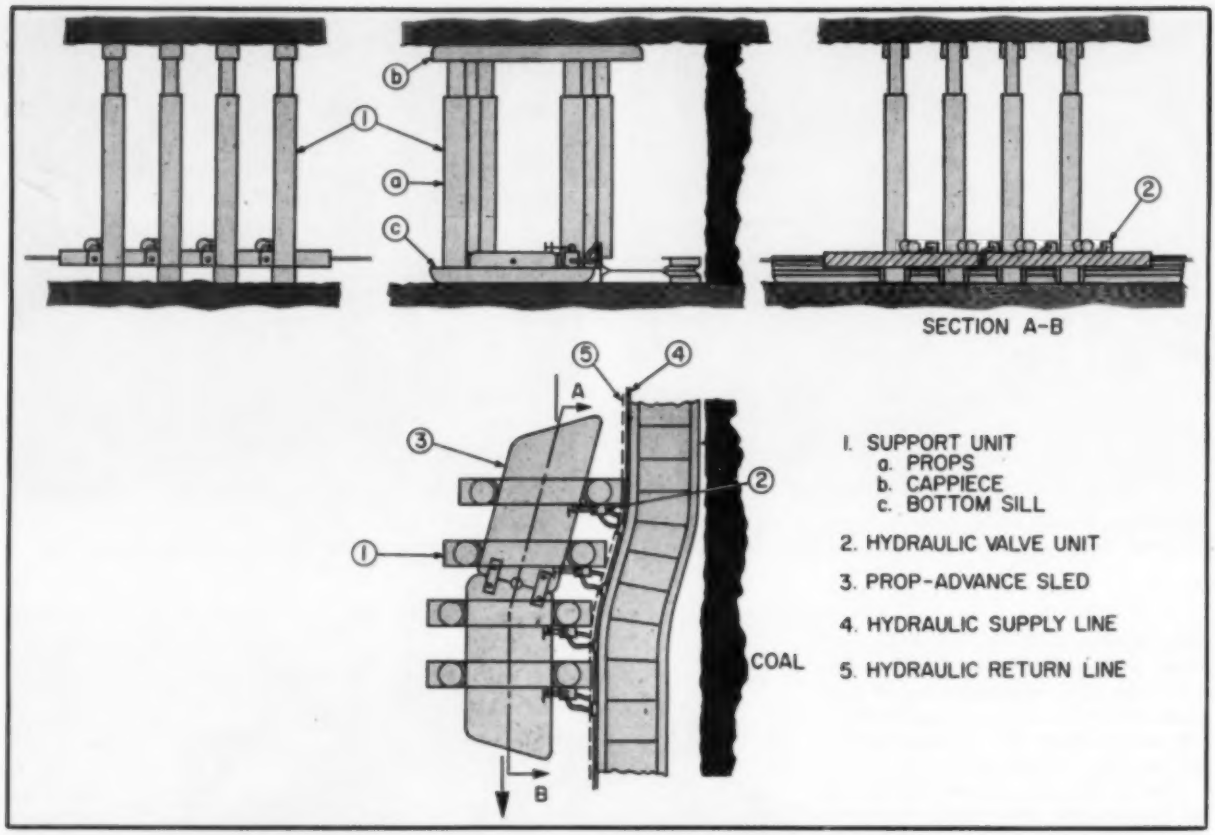
A clamshell loads railroad cars and trucks from the pile. Trulite has an arrangement with Truax-Traer to set in empties and deliver the loads to tracks of the C. & O. and N. & W., with connections to the B. & O. railroad. Truax-Traer also will load the aggregate into barges on the Ohio River.

Cubic-foot weight of the Trulite aggregate is approximately 40 lb in the 3x0 size and 50 to 60 lb when crushed to ⅜ in. A 50-ton hopper car, which normally carries 58 tons of coal, will carry 48 tons of the aggregate.

Thirteen electric motors ranging in size from 1 to 40 hp, drive the plant. Total connected horsepower is 143.5. Principal motors and controls were furnished by Westinghouse. Combination starters are used for motors larger than 2 hp, and fused-switch starters for motors rated at 2 hp and under.

Push buttons and indicators, controlling all drives, are grouped on one vertical panel in an operating booth adjoining the furnace room.

Electrical installation was handled by Hawes Electric Co., Huntington, W. Va. The contractor for erection of the plant proper was E. R. Wiseman, also of Huntington. As previously mentioned, the company is keeping in mind possibilities for plant expansion.



AUTOMATIC ROOF-SUPPORT SYSTEM for longwalling features a hydraulic-valve operating sled which is hauled through an opening in the prop units to release, advance and reset the supports as successive cuts are removed from the face.

Overseas Designs for Mining

NEW MACHINES and improved methods of mining, promising increased efficiency in longwalling and steep-pitch mining, are now in service or undergoing tests in the Ruhr. In one instance, a 170-ft face on a 70-deg pitch yields 140 tpd from a 3-ft vein without workmen at the face. Roof support consists of a packwall confined behind a movable wire net which is advanced along with the face.

Other developments include "push-button" roof supports designed for automatic advance and resetting in longwall operations; yielding props employing a lightweight hydraulic pump for setting the wedge; and face lamps powered from unit generators which are driven by compressed air.

These are some of the observations of Walter L. Herold, consulting engineer and mining-machinery manufacturer, Scranton, Pa., based upon his trip to an international machinery exhibit at Essen last Fall, and subsequent field trips to progressive mines in the Ruhr. The following material is a more complete description of such machines and methods by Mr. Herold, as told to a *Coal Age* editor.

MECHANIZED ROOF SUPPORT

One of the features of the exhibit was a model of a fully mechanized hydraulic roof-support system which makes it possible to talk in terms of push-button control of longwall operations. As shown in accompanying illustrations, the equipment includes:

1. Support frames each consisting of two hydraulic props, a roof bar and a floor bar. The props are similar to the cylinder and piston of a normal hydraulic press but no valves are incorporated in them.

2. A valve box at each frame having inlet and release valves and an excess-pressure valve. Inlet and release valves are lever operated.

3. A hydraulic pump and drive with pressure and return hoses connecting the pump and the valve boxes.

4. A winch-drawn sled which operates the valves and advances the support frames mechanically.

Here's how the system operates:

The props are automatically set to their full bearing capacity by the hydraulic pressure created by the pump. When the face has advanced, the sled is winched through the space between the two rows of props. As the sled travels, small projections on its top

surface operate the valve levers in sequence. First, the release valve of the first frame is tripped, releasing the props so that the roof bar is clear of the roof. The offset end of the sled then moves the support frame toward the face as the sled continues its travel. When the final position is reached by the first support frame, the inlet valve is operated by another projection on the sled, resetting the props to their full bearing capacity.

The configuration of the sled and its rate of movement are so designed that the second support frame is not released until after the first has been reset. Only the frame which is being advanced and reset is not carrying a full load. The loaded frames act as guides for the sled.

The actual equipment also includes links between adjacent floor bars and ropes between adjacent roof bars to maintain the alinement of the frames. The design of the sled permits vertical movement to compensate for unevenness of the floor, and it may be winched in either direction in the event difficulties are encountred. Furthermore, stowing equipment may be attached to the frames if the mining system calls for a packwall, and the sled may be used to transport men and materials to the scene of any stoppage along the face.

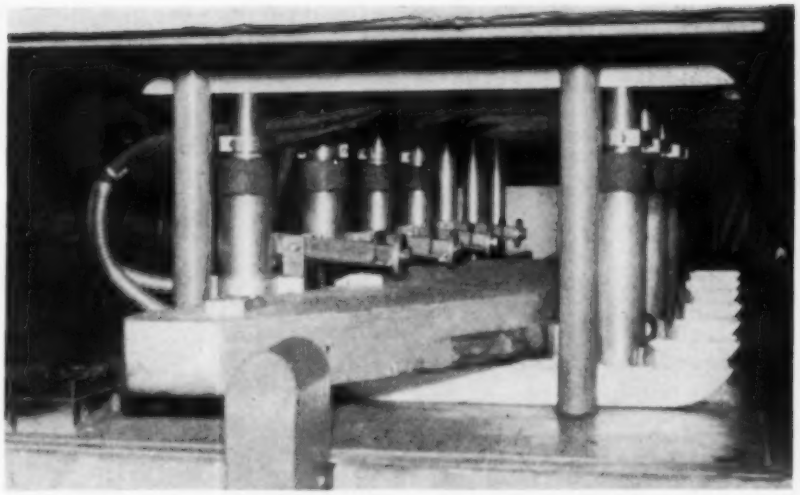
The big benefit, of course, is the great reduction in face labor that may be realized through the use of such equipment, since most longwall workers are engaged in advancing roof supports.

This push-button support system is a product of Becorit Grubenausbau GmbH., Recklinghausen, Germany.

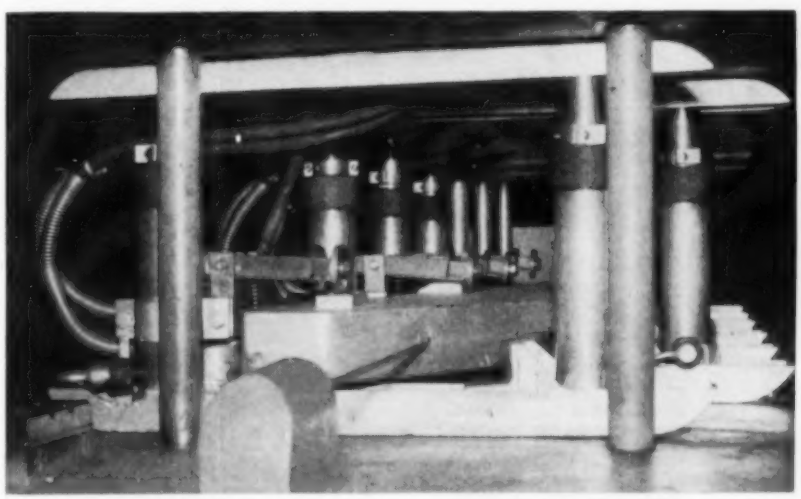
The Eickhoff organization offers another design for automatic roof support in longwall operations. This unit employs a pantograph-type of linkage among a set of hydraulic props which permits the rows of props to be advanced as necessary to serve the face operations.

Another Becorit development is a pit prop having a lock which may be set hydraulically. Like other Becorit props, this one has a bearing capacity of from 45 to 50 tons after a short yield. The locking wedge is set by a small hydraulic press connected to a hand-operated pump, as shown. The pump is preset to deliver a certain pressure, and when this value is reached an audible signal is emitted from the excess-pressure valve. The pump and press then are disconnected by the operator for use on the next prop to be set. The advantage is that all props in a working place may be set for the same loading, thus contributing to more-positive roof control.

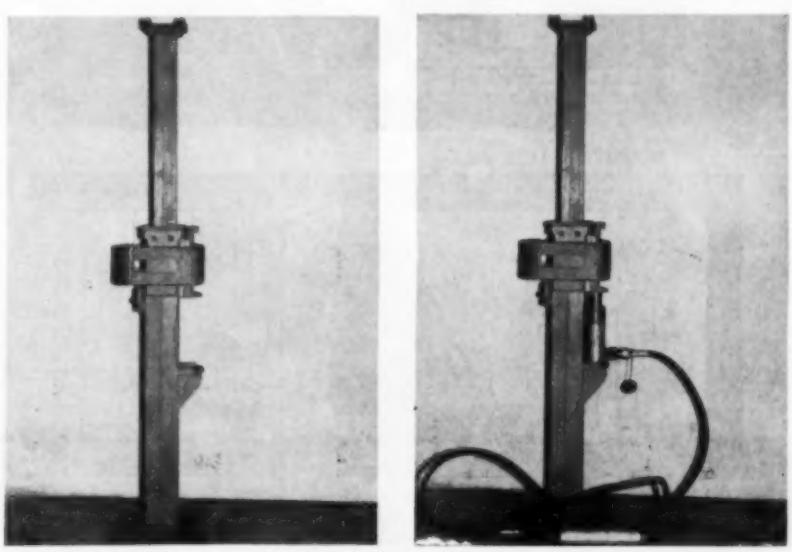
(Continued on next page)



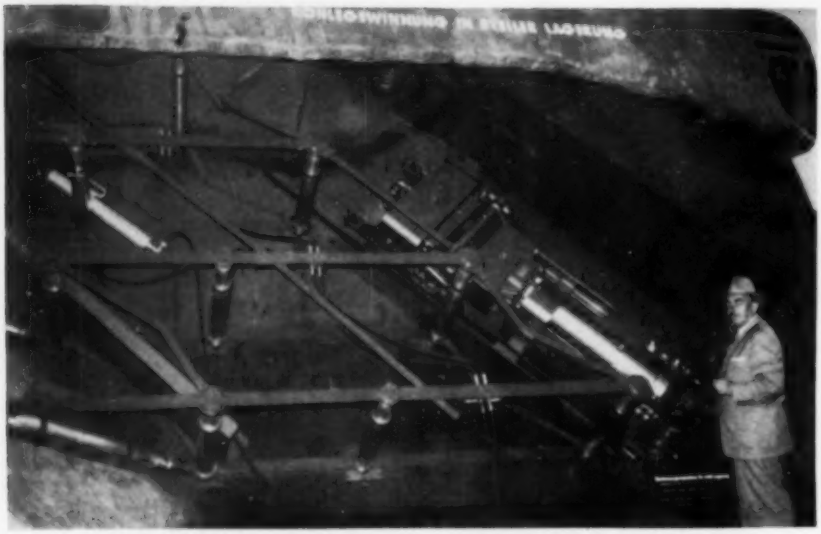
MODEL of fully-mechanized roof-support unit shows all props under full load before sled is hauled through opening between rows of props.



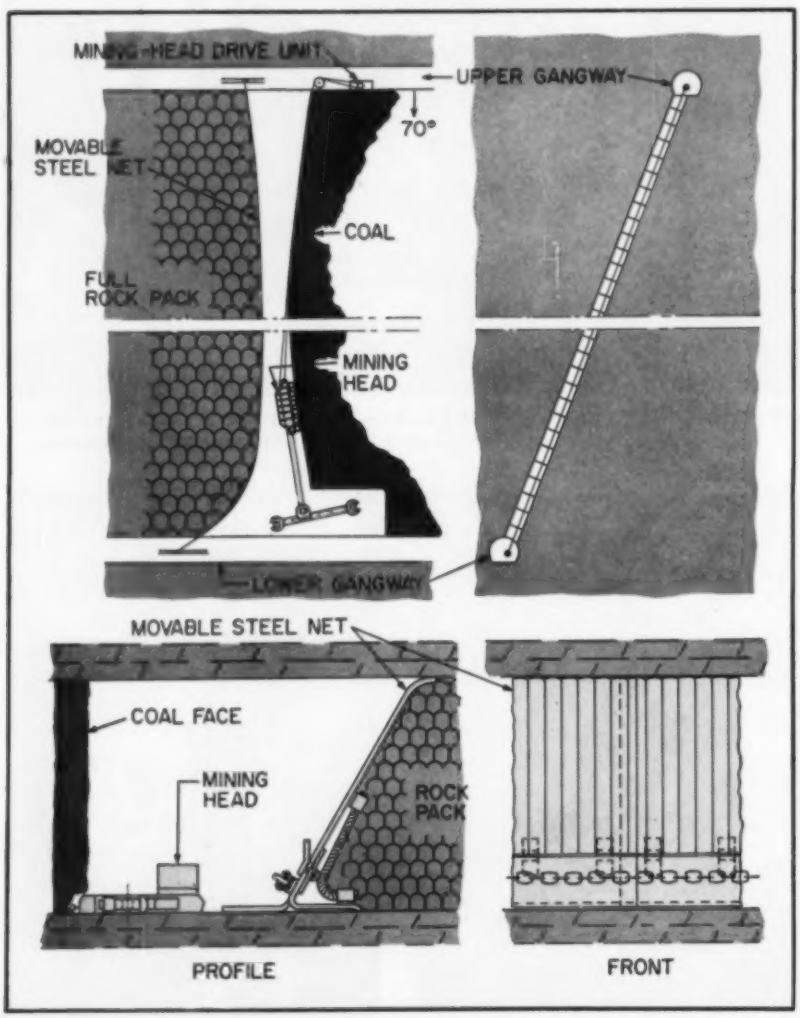
SUPPORT FRAME in foreground has been released and advanced as projections on top of traveling sled operate hydraulic valves on support frames.



NEW PIT PROPS are equipped with locks which are set by hydraulic press and hand-operated pump for even loading of all props.



MR. HEROLD, at Essen exhibit, inspects roof-support system in which rows of props are advanced hydraulically and kept in alinement by pantograph linkage.



STEEP-PITCH LONGWALLING requires no men along the face with packwall which is filled from upper opening in back of movable net.

"MAN-LESS" STEEP-PITCH MINING

In the field, one mine is producing 140 tpd from a 170-ft face on a 70-deg pitch without employing men at the face, as previously mentioned.

The coal is cut from the face by a type of undercutting mechanism which is hauled up and down along the face by a hoist in the upper development opening along the strike of the coal strata. The men work only in the upper and lower development openings.

Outstanding feature of the operation, however, is the "traveling packwall" which provides the necessary rear abutment for effective, predictable roof control. The restraining medium for the backfilling material is a heavy steel mesh. As shown in the diagram, the mesh is suspended from a traveling carriage in the upper development opening to another in the lower opening, 170 ft below. The entire assembly is moved forward as the face advances to maintain the face opening required for operation of the coal-cutting device. Backfilling material is dumped behind the net from the upper opening.

As a matter of fact, steep-pitch mining now is considered to be the cheapest method of recovery in Germany. At one mine, a 700-ft-long face on an 85-deg pitch delivered approximately 900 tpd at one loading point in a 7-ft vein. Roof support is a combination of full rock pack and light metal props.

At another mine, a 750-ft-long face on a 40-deg pitch delivered approximately 700 tpd at a single loading point in a 9-ft vein, using three rows of heavy steel props in a systematic-caving method of roof control.

IDEA FOR ANTHRACITE

Leading operators in the Ruhr give much credit to careful planning and systematic research in the development of these new methods and machines and in rendering obsolete the traditional methods formerly used. Industry spokesmen stressed the fact the mining in the Ruhr is more efficient than ever before. This is a tangible result of co-operation among mine operators, equipment manufacturers and a central research organization.

The Pennsylvania anthracite region has similar geological formations, indicating that long faces in steeply pitching coal may be the best method of recovery. But for some reason (perhaps a notion that it is too costly) this method has never found favor. However, the concentration of operations resulting from a change to such methods would be beneficial, and the machines and know-how are available.

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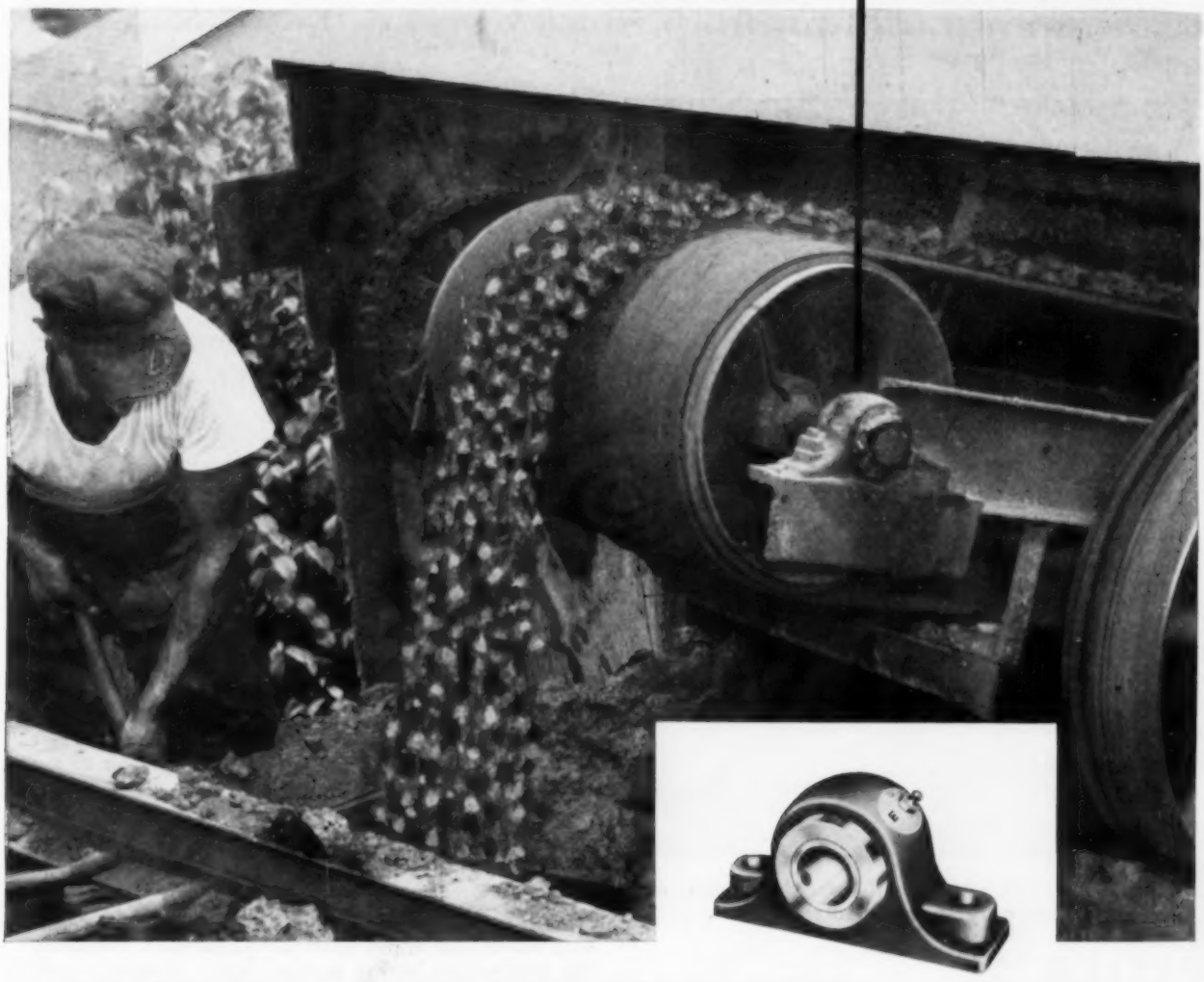

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FOREMEN'S FORUM

GOOD MAINTENANCE of workings can contribute only so much to safety . . .

ALSO NEEDED are proper attitudes on safety among men and supervisors.

Developing Proper Attitudes on Safety

Complete safety in mining requires that each supervisor and workman personally recognize his need for safety and assume a share of the responsibility for eliminating dangerous conditions in working places.

By ROBERT YOURSTON, Safety Engineer
Union Pacific Coal Co., Rock Springs, Wyo.

PERHAPS THE MOST IMPORTANT FACTOR in many mine accidents is the mental attitude towards safety held by the injured person. Despite its importance, it is the most difficult to assess when investigating a mine accident. The physical conditions of the accident site may be reconstructed from the evidence at hand, and the actions of the victim prior to the accident may be determined from witnesses.

All too often the most important question, the "why" of the accident, must go unanswered because there is no way of determining the mental attitude of the workman at the time of his injury. Mental attitude toward safety is a phase of mine accidents that requires further study.

Fundamentally, the responsibility for most mine accidents must rest at least in part upon the injured party. Frequently this responsibility borders on contributory negligence; more commonly it is just an improper mental attitude toward safety.

Unfortunately, development of proper mental attitudes is the hardest phase of accident prevention to pursue. In the face area, which is the scene of most accidents and those of greatest severity, the general physical condition of the working place, inherent dangers in the roof, thickness of seam and type of mining can be assessed by a responsible supervisor, and methods of safeguarding against these dangers can be set up.

Most commonly, this is merely adherence to our approved systematic method of roof support. The materials to carry out these protective measures can be brought into the section and their proper use outlined to the individual workman. The casual observer would say then that all necessary precautions had been taken for the protection of the men in this area; that no one could be injured.

You and I know this is not true, that if safety is left at this point we are going to have accidents and many of them.

The reason for this is simply that despite systematic timbering methods, an abundance of roof-support material and supervision, an improper mental attitude toward safety in the individual can still lead to another lost-time injury.

How then can we bring about this proper attitude? The following four points may hint at asolution.

Adapted from an article in the September, 1955, issue of Safety Review, published by The Union Pacific Coal Co.

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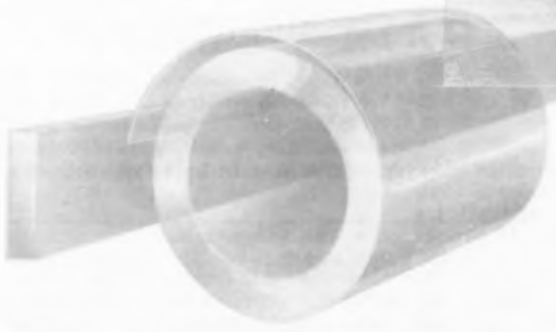

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1. **Be continually conscious of the need for safety.**
2. **Train ourselves to recognize dangerous conditions.**
3. **Maintain a fresh approach to our daily work.**
4. **Assume responsibility for our own protection.**

Consciousness of the need for safety can rightly be expected of every workman, but study of many accidents points out that many men fail to recognize this responsibility. His safety is important to a great many people but most of all to himself since he is the one who suffers the physical discomfort and monetary loss attending most accidents.

His safety is important to his family also because the family depends upon him for guidance and support. His safety is important to his community because of the place he holds in its affairs. Finally, safety is important to an individual's employer for, aside from personal regard, the worker's skills are vitally important to him in maintaining an efficient, economical mining operation.

Convincing each man of his own importance may help him recognize his personal need for safety.

Having sold ourselves and others on the need for safety, we must recognize at once the dangerous actions and conditions that lead to accidents. If we fail to recognize such actions and conditions we cannot react in the proper manner.

This ability to recognize hazards comes through training and experience. In our present situation we have few men who could be called inexperienced miners. Perhaps because of this situation our training has been somewhat lax for experience alone is not the complete answer.

Many men are being transferred to new jobs with the emphasis on mobile mining. Roof-support plans, haulage systems and preparation and loading cycles are different. Therefore, the men must be taught to recognize the hazards in these new activities.

Supervisors must assume the duty of instructing new men coming into their sections, even though they may have had 10 yr or more of previous mining experience. In addition to recognizing dangerous physical conditions we must look for human failures in ourselves and in the workmen. It has been said that fully 80% of all accidents involve human failure, and while it is true that not every dangerous act results in an accident, it is equally true that few accidents would occur if some element of human failure was not present.

Once we have learned to recognize dangerous conditions and dangerous actions we can guard against them, and then we have come a long way in developing the proper mental attitude toward safety.

By maintaining a fresh approach to our daily work we are better able to recognize the conditions that lead to an accident. There is a saying, "Familiarity Breeds Contempt," that applies to many of us in our regard for dangerous conditions in the working places.

This is a damaging attitude and is frequently the basic cause of a serious mine injury. The experienced man has the ability to recognize a dangerous condition and effectively control it, but unless he maintains a fresh approach to his work he will overlook many hazards.

Learn to analyze methods of doing the work, whether it is running a cutting machine, timbering or any of the other mine operations. See that the work is done in the safest manner. Perhaps you will find yourself doing something in a dangerous manner when the safe way would be the easier way.

Finally, we must all assume responsibility for our own safety. We have heard of defensive driving on the highway. It means expect the unexpected. Develop defensive methods of working as well as driving.

Don't assume the roof is good. Prevent roof-fall accidents by testing the roof and supporting it.

Prevent haulage accidents by seeing that clearance is maintained and that all safety rules are observed.

Defend against all accidents by developing and keeping within yourself and others a proper mental attitude toward safety.

Self-Starters for Dull Days

WAS THIS one of those days when you decided about 10:00 A. M. that you might better have stayed in bed? Such days come to all foremen and executives and unless something is done about them they are wasted days. Too many days like this cut into the results of the good days and make them mediocre. These are among the observations in a piece we received the other day from Ernest W. Fair, Boulder, Colo.

Mr. Fair points out that topnotch leaders never seem to worry about dull days. They have become leaders because they have learned to fill every day with worthwhile results, no matter how badly it started. All of them have developed "starters" they put to use on days when their spirits are low and they are tempted to forget the job and go fishing.

One man finds that the bad days are chiefly in his own mind, unless some physical ailment is really bearing down. His remedy is a complete change of occupation in order to overcome the mental depression of the moment. A change like this, perhaps for only a half hour, relieves tensions. This is infinitely better than trying to fight one's way through a bad day.

Several others point out that many "bad starts" result from becoming bogged down in the routines of their work. Their solution is to get out of the pattern by trying out some new ideas they may have had in mind. Tackling a new problem is a good way to shake out of the doldrums.

Sometimes the bad starts result from a long series of days and nights of work when a supervisor has overtaxed his physical and mental facilities. All successful men drive themselves to far limits, but they also know how to relax completely when the sixth or seventh day rolls around. Hunting, fishing, golf and gardening, for example, are good safety valves as long as a fellow doesn't make work out of these pursuits. After this kind of relaxation, a man usually finds himself "rarin' to go" again.

Not to be overlooked is a need for proper diet, which means getting the right kinds of food, not merely enough food.

Other successful leaders and supervisors relieve routine by taking an active interest in some civic affair or project. People who keep themselves busy this way seem to get a good start almost every day. Their results show it:

We think the ideas have merit for mine supervisors. Good food is important, yes; and reasonable nighttime activities must be observed. Adequate rest makes one alert and energetic.

Other "self-starters" that mine supervisors can employ are:

- **Look for opportunities** to apply new ideas in the area you supervise. Once you work up your own interest, you have yourself started.

- **When faced with a flock of duties** on one of these dull days, select one item and concentrate on it until you have finished the job. That will clear the air.

- **If you feel that your job has become routine,** break that routine in your own mind first. You have splendid opportunities to be of greater service to your men and your employers. Contributing good service is challenging, not dull.

- **Learn to unwind on your days off.** We know you are on 24-hr call, but enjoy in your best way the hours when you are not being called. A rested, relaxed supervisor is easier to live with and work for.

- **Visit with your staff.** Chat with the men as a friend—not as a disciplinarian. Show them that you are genuinely interested in their families and in their personal and job problems. Offer helpful suggestions where possible. You will boost their morale and performance; in the process, you will boost your own.

- **Control your temper.** You're more likely to be irritable on dull days.

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IRONCLAD® MINING BATTERIES

LOW-SEAM MINES GET LOWEST-COST HAULAGE ...WITH EXIDES

HAULAGE IS SPEEDED FROM FACE TO DISCHARGE POINT, PRODUCTION IS BOOSTED THROUGHOUT THE MINE WITH EXIDE-POWERED SHUTTLE CARS. DEPENDABLE EXIDE-IRONCLADS GIVE YOU MORE TRIPS PER SHIFT, MORE PRODUCTION PER MAN-HOUR, LOWEST HAULAGE COST PER TON! THEIR AMPLE POWER KEEPS EQUIPMENT WORKING FULL-SHIFT, WITH NO LET-DOWN IN PERFORMANCE. WITH LOWEST COSTS TO OPERATE, OWN AND MAINTAIN, EXIDE-IRONCLADS ARE ALWAYS YOUR BEST MOTIVE POWER BUY—

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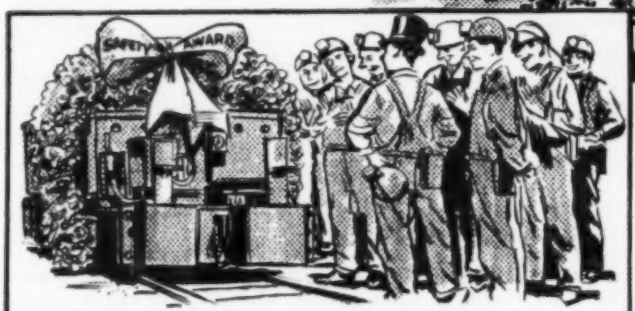

EXIDE-IRONCLADS ARE *THREE WAYS SAFER!*

MINE LOCOMOTIVES, SHUTTLE CARS AND TRAMMERS POWERED WITH EXIDES KEEP SAFETY-FIRST ENGINEERS SATISFIED BECAUSE: THERE'S NO NEED FOR OVERHEAD WIRES AND TRAILING CABLES—THE HAZARD OF STRAY CURRENTS IS ELIMINATED— POWER IS BOTH INDEPENDENT AND AVAILABLE, IN THE EVENT OF INTERRUPTION OF NORMAL POWER SUPPLY OR ACCIDENT.

TUBES OF POWER WORK FOR YOU INSIDE AN IRONCLAD

SLOTTED TUBES INSIDE AN IRONCLAD KEEP ACTIVE MATERIAL IN FIRM CONTACT WITH CONDUCTING GRIDS OF THE POSITIVE PLATE... THIS GRID PROTECTION LENGTHENS THE LIFE OF THE BATTERY. SLOTTED TUBES EXPOSE MORE ACTIVE MATERIAL TO THE ELECTROLYTE... FOR GREATER POWER. FINE TUBE SLOTS HOLD MATERIAL IN CONTACT WITH GRID LONGER. RESULT: THE IRONCLAD'S ABILITY TO DO YOUR MINE HAULAGE JOB FOR A LONGER PERIOD OF TIME. THAT'S WHY EXIDE-IRONCLADS ARE YOUR BEST MINING BATTERY BUY—

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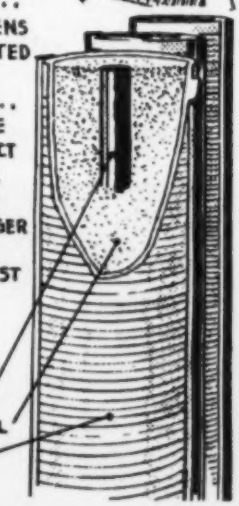

LET EXIDE HELP SOLVE YOUR MINING BATTERY PROBLEMS. ❶ CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ❷ WRITE FOR FORM 1982, A MANUAL ON MAINTAINING MOTIVE POWER BATTERIES.

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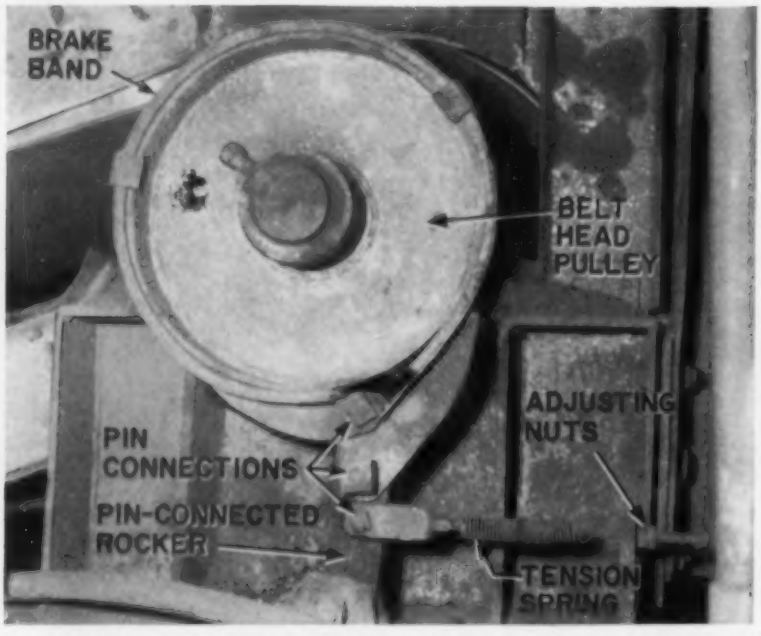
OPERATING IDEAS



AUTOMATIC BRAKE (left photo) for inclined conveyor prevents loaded belt from running backward and causing coal pileup. Inventor D. L. Henley (right photo) says difficult restarting and belt damage are eliminated.

Automatic Brake Prevents Belt Runaway

BELT RUNAWAYS are prevented at the Otsego tipple of the Brule Smokeless Coal Co. by an automatic brake patented by Dan L. Henley, tipple foreman. The safety device permits free rotation of the drive pulley while the belt is moving forward. But when it stops the brake automatically tightens and prevents backward movement. In service over 3 yr, the unit has never needed any repairs.

The automatic mechanism includes brake bands fitted to each end of the drive pulley. Each has a base anchored to the floor and upright flanges in which a pivot pin is supported. A rocker, to which the ends of a brake band are connected, is pin-connected to each of the flanges.

An upright at the end of the base opposite the flanges supports a horizontal threaded rod. A spring connects the rod and a forked member which is pin-connected to the rocker. By proper adjustment of spring tension, the rocker is held in the position that produces the proper friction in the brakes.

One end of each brake band is pivotally attached to the upper end of the rocker. The other end is attached midway of the tension adjustment.

When the belt is operating normally, the drive pulley rotates clockwise and the pin-connected rocker holding the ends of the brake bands is pivoted counter clockwise. Thus the brake is maintained in the release position. When the belt stops, the tension spring pulls the rocker clockwise to tighten the brake and thereby prevent the belt from rolling backward.

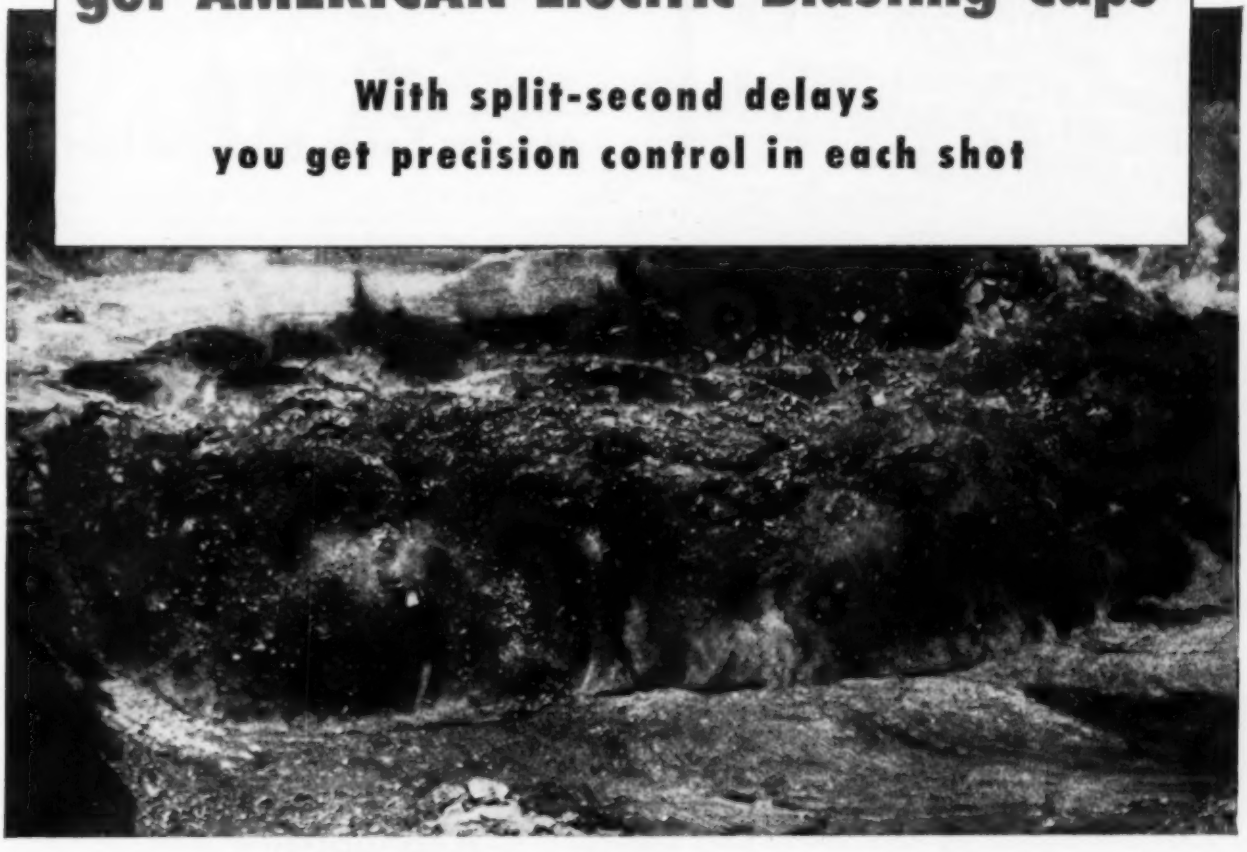
During the 8 yr he has been tipple foreman Mr. Henley had a failure of the old brake about once a week and frequent replacement of brake bearings and shaft were necessary. A suitable electric brake could not be attached to the head shaft and, as a result, the new device was developed.

Old-Tire Anchor Saves Shuttle-Car Cables

LONGER LIFE for trailing cables on shuttle cars can be achieved by anchoring them to a discarded tire held in place by a mine timber. The timber is placed through the middle of the tire and thus the tire is free to rotate as the shuttle-car cable changes position. As the car passes the anchor point, the tire rotates around the timber in the direction of travel, preventing short cable bends and acting as a shock absorber. By cushioning the cable against sudden jerks, the tire helps prevent cable stretching.

Get accurate timing...
get AMERICAN Electric Blasting Caps

With split-second delays
you get precision control in each shot



Produced for closest timing accuracy, AMERICAN Electric Blasting Caps reduce the chances of overlapping and cut-through to a minimum. Your shots go off when they're supposed to, in the sequence you want.

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So for best results on every job, call your shot with AMERICAN. Magazines are conveniently located.

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High Explosives	Electric Blasting Caps
Permissibles	Instantaneous
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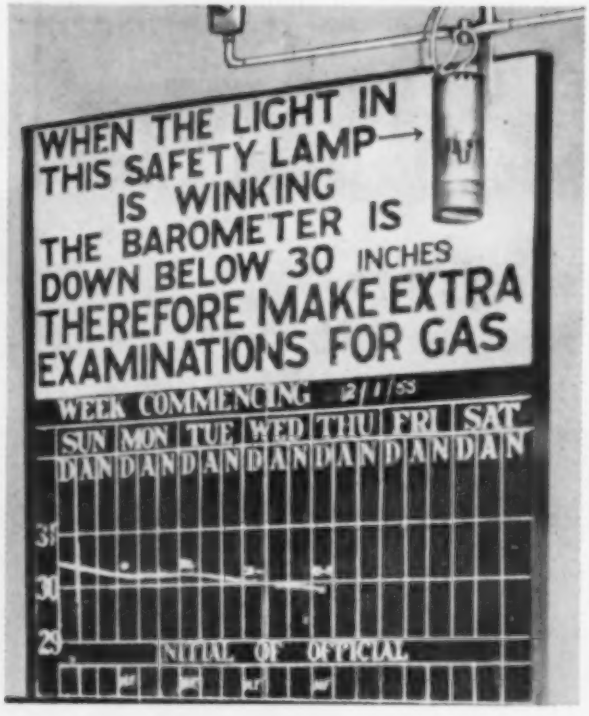
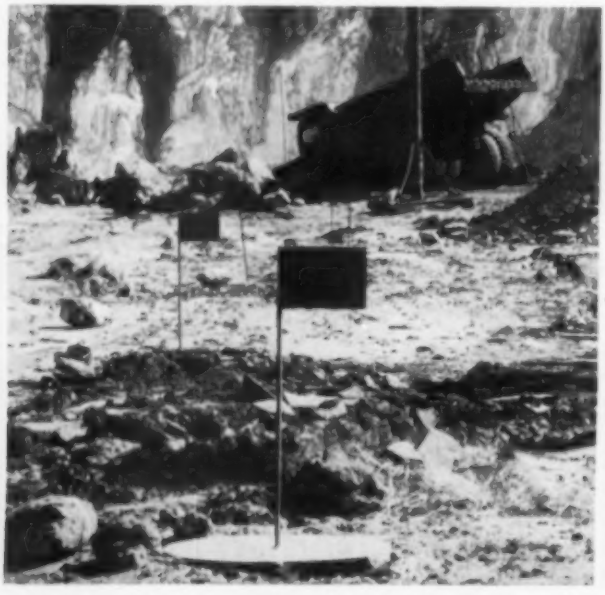
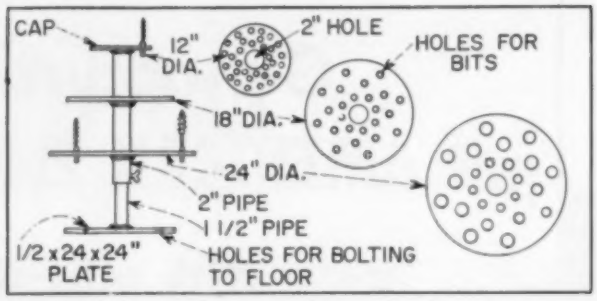


Flashing Lamp Warns Of Barometer Drop

AN AUTOMATIC WARNING to alert personnel when the barometer falls below a predetermined level has been developed at the Grimethorpe colliery in Great Britain, according to an article in a recent issue of Colliery Guardian. The device is designed so that when the barometer falls below the prescribed value a flashing warning light operates in a safety lamp on a special notice board in the lamp room. The board also carries a chart which is marked each shift to show the general trend of the barometric pressure.

The prominently displayed warning light and board draw the attention of all underground workers, particularly those who carry safety lamps or other gas detectors, and remind them that extra care is needed.

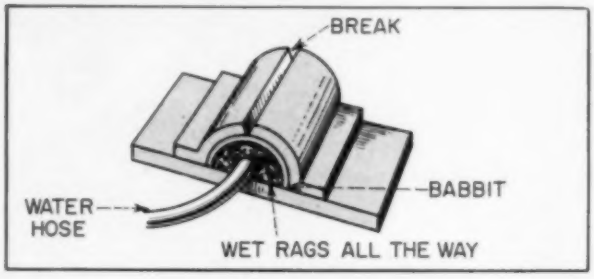




Holder Eases Bit Selection

FAST AND EASY selection of drill bits in the shop is possible when they are stored in a revolving stand made of pipe and steel plate, according to *The Stabilizer*, a publication of Lincoln Electric Co., Cleveland. The base is made of ½x24x24-in steel plate drilled to permit bolting to the floor. The holder includes three pieces of circular steel which are fitted over and welded to a section of 2-in pipe. Holes are drilled in each circular piece of steel to serve as drill receptacles. A piece of 1½-in pipe welded to the base serves as an axis about which the drill holders can be rotated to permit easy selection of bits.

The 2-in pipe with the holders fits over the 1½-in pipe. A set screw may be put in the 2-in pipe to permit vertical adjustment of the stand.



Welding Saves Rebabbitting Job

INGENUITY paid off in repairing a cracked babbitted bearing cap, reports *The Stabilizer*, a Lincoln Electric Co. publication. A hurry-up repair job on the bearing cap was done because a new cap was not available and rebabbitting would be difficult.

A V was ground along the break in the casting, leaving the babbit intact. Next the casting was clamped on a heavy plate and rags were packed around a small water hose which was placed inside to prevent the babbit from melting.

The V-cut then was welded a little at a time with "Softweld" and no harm was done to the babbit. Down time was about 1 hr as compared to 6 hr needed to weld and rebabbit. Success of the method is proved by the fact that the repaired cap is still in service 4 yr later.

Metal Hole Covers Aid Pit Operations

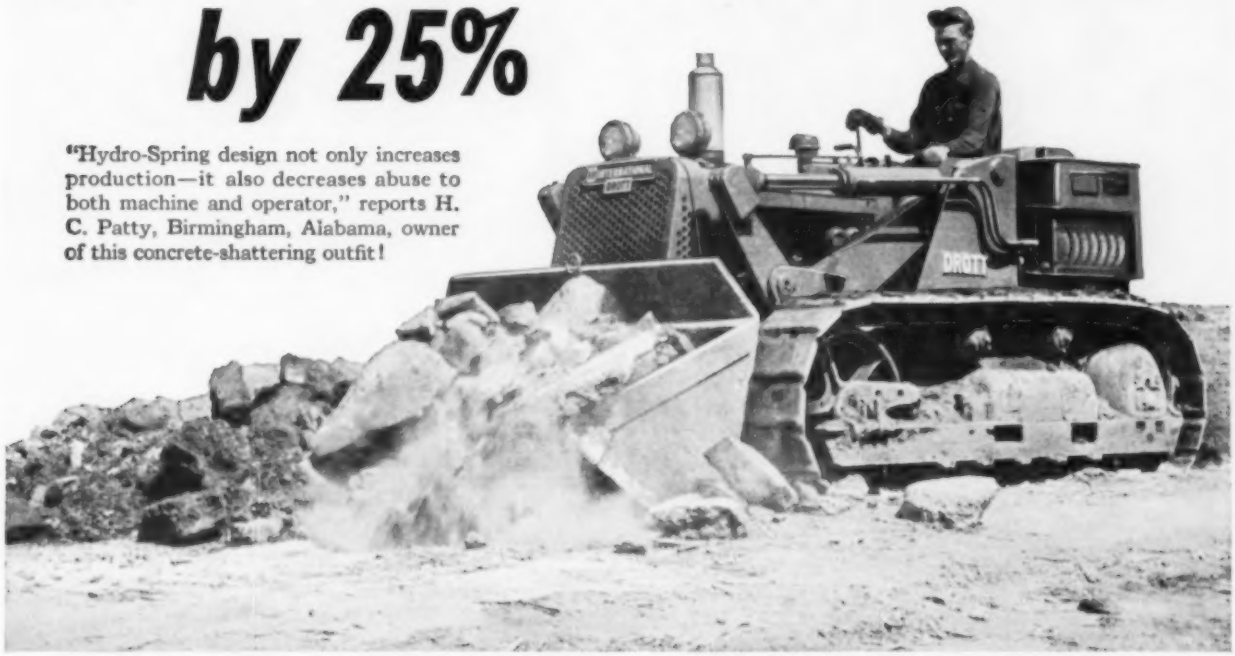
FLAGGED BLASTHOLE COVERS are used to mark new drill sites and drilled holes at the Minnesota ore mines of the M. A. Hanna Co., according to *Engineering and Mining Journal*, a McGraw-Hill publication. A piece of reflective tape on each flag makes it readily visible at night. Drilling or loading instructions also may be written on the flag with soapstone.

Markers are made with a 22-in-diameter base of ⅛-in mild steel. The 6x8-in flag of similar material is welded to a 30x½-in mild-steel rod. That, in turn, is welded to the center of the base. The whole unit is painted red for easy recognition.

How Hydro-Spring's "Shock Cushion" Helps Skid-Shovels outlast all others

by 25%

"Hydro-Spring design not only increases production—it also decreases abuse to both machine and operator," reports H. C. Patty, Birmingham, Alabama, owner of this concrete-shattering outfit!



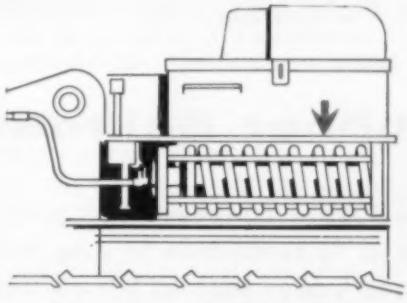
Slam this super-stout bucket into compacted material, and you generate impact stresses that make unprotected front-end loaders shudder!

But International Drott Skid-Shovels smother these shocks enroute, before they can sprain a sacroiliac, strain a track frame, or maim a final drive! Machine-mauling shock stresses "lean" against exclusive Hydro-Spring's "magic cushion"—and they're absorbed!

No Strain! No Pain!

You apply the patented pry-action break-out—and you get up to three times as much material-loosening, bucket-cramming force as the ordinary front-end loader can muster. Even then, shock-swallowing Hydro-Spring wards off strain and pain! *Owners declare that Hydro-Spring adds a whopping 25 per cent to loader and tractor life—reduces downtime and boosts production, too!*

No other front-end loader has Hydro-Spring advantages—which you get in four big-capacity, contractor-proved International Drott Skid-Shovel sizes. Why not ask your International Drott distributor for a demonstration of the money-making size best suited to your needs?



How exclusive Hydro-Spring works and saves for you!

Exclusive Hydro-Spring is a hydraulic cylinder enclosed in a heavy-duty coil spring. Shock force displaces oil from main lift cylinders into the Hydro-Spring cylinder—extending it and compressing the big spring to *absorb* and *cushion* impact loads. Hydro-Spring reduces the consequences of shock forces *by an actual 67 per cent or more*—also eliminates most hydraulic hose failures!

INTERNATIONAL HARVESTER

INTERNATIONAL® DROTT

Overall view showing U. S. Giant conveyor belts running from loading hoppers to transfer station to storage pile.

Rubber Beltroad saves over $300 a week!

U. S. Rubber conveyor belt plays a major role in "a revolution in strip mining techniques", says supt. of Illinois mine

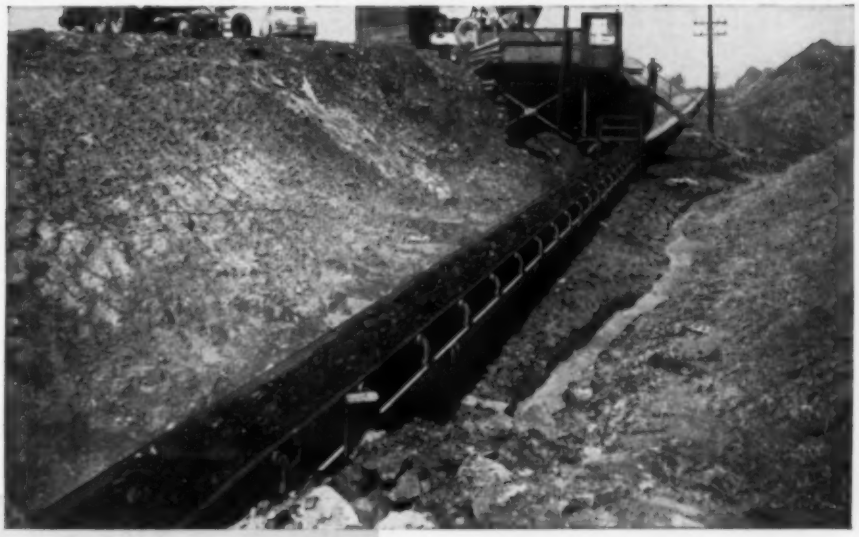
You are looking at the first overland belt haulage system that's part of a strip-mine operation in Illinois. In this mine, opened in 1952, a United States Rubber Company belt carries bituminous coal (mined in open pits) to the storage piles. Previously, trucks were used. But as the mining operation progressed further from the tipple, more trucks were needed to keep up the production rate; more roads had to be built and maintained; more men were needed to drive and maintain the extra trucks. There was also a big risk: a change in pit location meant the loss of investment in the roads.

The installation of the belt conveyor system has already resulted in savings of over $300 (or over 10¢ a ton) a week. Greater economies are soon to come, because another "U. S." belt is being installed to service another section of the mine. The operators of the mine predict that belt haulage will eventually become "standard practice" with many strip operators, because the "savings are obvious and easily offset the very small capital investment."

A portable system

One of the main advantages of this system is that it is portable. Any change of pit location simply means moving the belt line to that area—a simple matter.

US RUBBER



View of U.S. Giant Conveyor Belt taking raw coal from semi-portable loading hopper and starting it on its way to tipple.

View of 330-foot-long gallery enclosing U. S. Giant Conveyor Belt hauling raw coal from transfer house to stock pile.

As the pit progresses overland—an additional length of belt is added—again a simple matter.

Allows large stocks of coal to be kept on hand!

Over 5000 tons on hand all the time, as compared to 250 to 350 tons in the old-fashioned method. This enables the mine officials to have more control over operations than before, where the whole mining operation was tied together so strongly that if one step went out of order, the whole system was stopped. The large stock pile allows the miners to continue working without a tippling operation—or the tipple can produce without a mining operation. The U. S. Rubber Giant®overland conveyor belt was one of the major factors making this stock pile possible.

Such success in materials-handling is achieved by our close cooperation with the engineers of the mine and the engineers of the equipment makers. Our wealth of experience in reducing "tonnage-hauled" expenses is at the call of industry. Get in touch with us through any of the 27 "U. S." District Sales Offices, or write United States Rubber Company, Mechanical Goods Division, Rockefeller Center, New York 20, N. Y.

Mechanical Goods Division

United States Rubber

EQUIPMENT NEWS

Single Transformer Unit Heats Pair of Screens

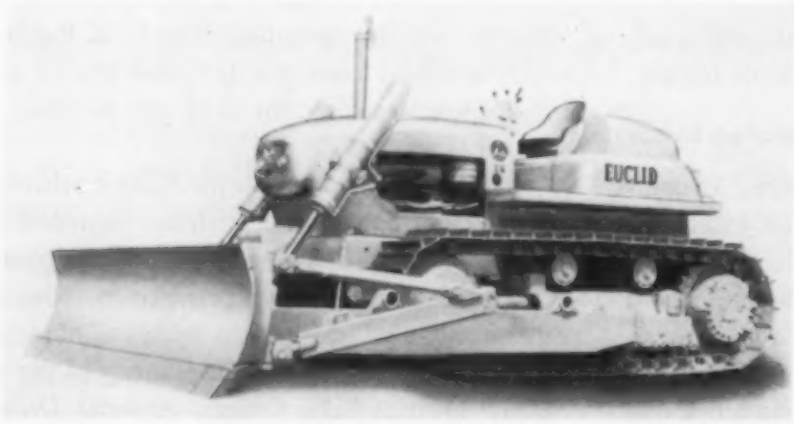
Paired screens equipped with a single 20 kva heating transformer are being produced by the Deister Concentrator Co. The company points out that a single screen requires a 15 kva transformer and says "it is apparent" that the idea will save in equipment costs. An added saving, the company says, will be a reduction in electric power, since two screens, each equipped with a transformer, would require more current. The Deister duo screens also feature permanent bus bar assemblies and elimination of flexible cables.

Tramp Iron Magnet, Small Brake Developed

A new line of "Discardo" cross-belt magnetic separators that remove tramp iron and automatically discharge it away from the flow of material in a continuous operation, has been developed by Stearns Magnetic Inc., Milwaukee, Wis. At the same time the company has announced a new "H" style 1200 series magnetic brake for use in the 50 to 100 hp range.

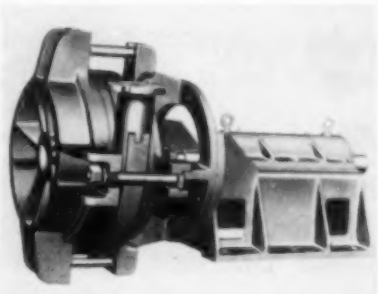
Suspended above a conveyor belt, chute, or sorting table, the "Discardo" separators create a magnetic field that pulls tramp iron from material flow. Iron is attracted to the magnet face where a cleated endless belt automatically carries it out of the magnetic field and discharges it away from the conveyor or chute. Frequent magnet inspection and hand cleaning are eliminated, the company says.

As for the new brake the company says design improvements have reduced brake dimensions with no decrease in torque rating. Up to 5¾-in less clearance is required for housing removal. Diameter has been reduced 2 in and the brake length has also been shortened. Four torque ratings are available: 230, 345, 460 and 575 lb ft. The new brake can be supplied for motor or floor mounting and operates on ac or dc.



Crawler Diesels Cut To One In Second Model

Euclid's 34,000 lb C-6 crawler shown above is, in effect, a half-section of a larger tractor model, the TC-12, since the C-6 is powered by a single 194-hp 6-71 Detroit diesel engine, the TC-12 by two. The C-6 also has the same styling, controls, automatic track tensioning, Euclid planetary final drive gearing, hinge mounted engine cover and rear mounted swing-down radiator as the TC-12. Its tracks are driven by an Allison torque converter and an Allison "Torqmatic" transmission. It can be shifted under full power without loss of motion, says the maker, and can be reversed while going forward. It has three speed ranges ahead and three in reverse. Top speed is 8.3 mph. The C-6 is the second model of a line of crawler tractors being developed by the Cleveland, Ohio, division of General Motors for earthmoving, open pit mining and industrial applications.



Supplement Pump Line

A heavy duty slurry pump, type RX, has been added to the line of the Morris Machine Works, Baldwinsville, N. Y. A low-speed, continuous duty pump, it is available in seven models from 2- to 6-in sizes and was designed to handle abrasive slurries of cement, sand, coal, solids, chemical sludges and plant wastes. Features of the pump, according to the manufacturer, are: (1) the stuffing box is subject to suction pressure only, (2) the wearing parts can be reached without disturbing the piping, and (3) the rotating element is adjustable to take up for any wear. The manufacturer adds that the liners on both sides of the impeller are renewable.


CP hydraulic
Coal Drill...
Drills a 9 foot
hole
every
30 seconds
in Hard Seams
They don't come any better than this CP-35-HCD Hydraulic Coal Drill:
REALLY SAFE. Provides absolute protection from electrical hazards . . . no sparks or shocks.
EASY TO HANDLE. There's no kick on stall. Its 35 pound weight and simple design make it a cinch for one man to operate.
PERFECT CONTROL. Its high torque motor and fast-acting throttle deliver that bonus power and quick response so important in hard seam drilling.
OPERATES FROM POWER SYSTEM of cutting, timbering or roof bolting machines.
MOTOR SPEED minimizes vibration and makes long lengths of auger easy to hold.
A complete line of accessory equipment . . . valves, gauges, junction blocks, hoses, and fittings is available. Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.
Chicago Pneumatic
PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Bigger, faster loads with the new LOWBOWL SCRAPERS

18 CU. YD. STRUCK
25 CU. YD. HEAPED

How Caterpillar's new, exclusive LOWBOWL design pays off for you!

Compare these two scrapers – the new No. 470 with LOWBOWL design and the sideboarded No. 21.

Both scrapers were loaded with the same material under identical conditions.

Result: the No. 470's net load weighed 5000 pounds *more* than the load in the No. 21–which is a profitable margin in favor of LOWBOWL design.

The LOWBOWL concept features a bowl that has been widened and lengthened, and bowl depth has been decreased. Incoming material, meeting less overhead weight and internal friction, is loaded with less resistance clear out to the end of the loading cycle.

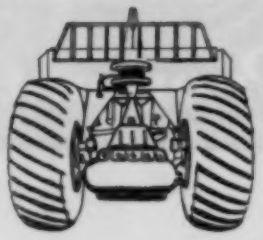
Result: faster loading for LOWBOWL design. Both the No. 470 and No. 456 feature this new concept in scraper engineering.

New No. 470 Scraper (left) with 5000 pounds more load than sideboarded No. 21 Scraper (right).

"BIG PRODUCTION" FEATURES

MORE POWER—300 HP at 1800 r.p.m. Ten per cent more rimpull. New 6-cylinder Cat Engine. Requires only one operating adjustment. Fan-belt tension regulated by convenient setscrew-adjustment of generator.

NEW TURBOCHARGER, driven by engine exhaust, utilizes energy which would otherwise be lost. Packs air into engine according to engine load, not speed. Delivers more working HP—greater performance.



NEW, BIG WIDE-SECTION 29.5-29 TIRES, developed after 3 years of Caterpillar and tire manufacturer research on actual earthmoving jobs, operate at lower pressures and provide greater flotation and traction.

LARGE AREA PUSHBLOCK gives better pusher contact, faster loading.

More power, bigger capacity in the new DW20-DW21 TRACTORS

300 HP

THE NEW FOUR-WHEEL CAT* DW20 Series E with new No. 456 LOWBOWL Scraper. Also available with the new W20 Wagon; capacity—20 cu. yd. struck. The new two-wheel DW21 Series C is available with the new No. 470 LOWBOWL Scraper.

In the DW20 Series E and DW21 Series C, Caterpillar offers you two new tractors and matched scrapers with exclusive LOWBOWL design.

Replacing the DW20 and DW21, world-famed earthmoving pace-setters, these new machines are built to deliver a new standard of money-making performance.

Their new LOWBOWL design utilizes maximum tractor and pusher power for bigger loads, faster loading times. Their greater power means faster cycles.

For complete facts, see your Caterpillar Dealer!

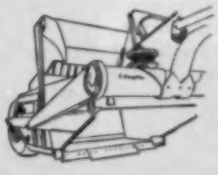
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NEW DW20-DW21, LATEST EXAMPLES OF LEADERSHIP IN ACTION

OF THE NEW DW20-DW21



INCREASED HIGH APRON LIFT provides faster ejection of any material.

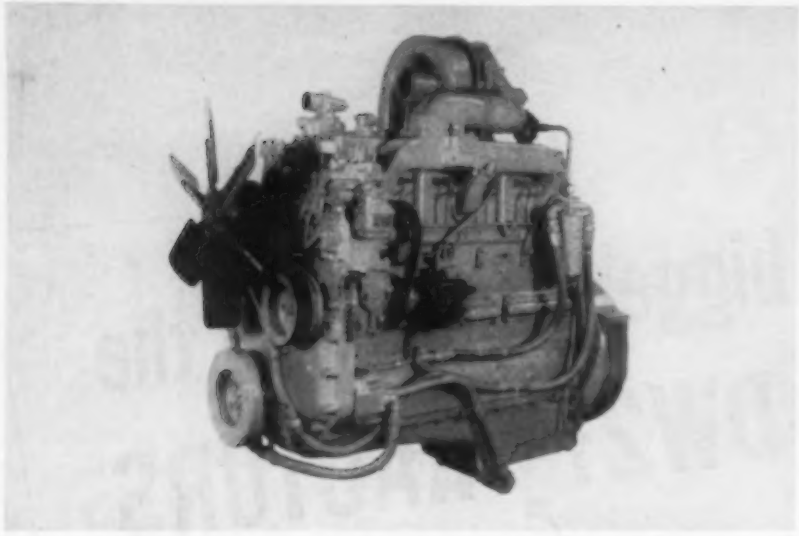
INCREASED SCRAPER GROUND CLEARANCE enables units to work even under extremely "soft" conditions.

HIGH SPEEDS FOR FAST HAULS
DW20 Series E, 2.8 to 32.1 m.p.h.
DW21 Series C, 2.3 to 20.5 m.p.h.

CHOICE OF STARTING METHODS, optional 24-volt direct electric or gasoline starting engine with 6-volt starting motor.

AUTOMATIC CABLE SAVER, standard equipment.

PLUS IMPROVED BRAKE CONTROL, more easily removed DW20 hitch arrangement, better protected DW21 hydraulic steering system and many other new and thoroughly tested Caterpillar features.



Turbocharger Boosts Diesel Power

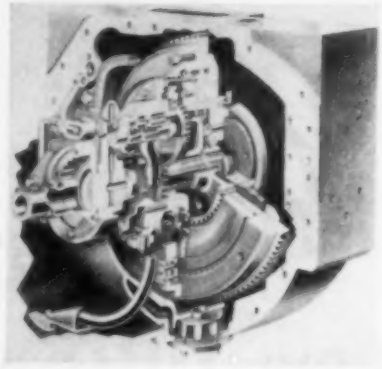
Two new turbocharged diesel engines, the NTO-6 and the NT-6 "Turbodiesels," are being produced by Cummins Engine Co., Inc., Columbus, Ind. Available for automotive, off-highway and industrial uses, the NTO-6 develops 262 hp; the NT-6 (above) is rated at 250 hp. Maximum speed of both is 2100 rpm.

Essentially the same design as the 200 hp NH-600, the NTO-6 and the NT-6 get increased power because of a turbocharger. Both are 6-cyl, 4-cycle engines with a bore and stroke of 5½x6-in and a piston displacement of 743 cu in. Compression ratio for both is 15.5 to 1, weight 2,546 lb.

The turbocharger was constructed by installing a gas turbine in the exhaust system. The turbine was connected by a shaft to a centrifugal blower. Expansion of exhaust gases in the turbine chamber puts exhaust heat to work by rotating the turbine blades, shaft and blower at high speed. By creating pressure in the engine intake manifold, the blower packs a greater weight of air into the cylinder, providing combustion of greater fuel amounts.

Maker Claims 'Most Powerful' Tractor Model Title

Introduction of a 165 hp turbocharged diesel engine for the Michigan Model 175A rubber-tired tractor shovel makes it the world's most powerful, the Construction Machinery Div., Clark Equipment Co., asserts. Able to operate at high altitudes the shovel's turbocharger uses hot exhaust gases to drive a turbocompressor that packs air into the engine's cylinders. Although new in powerplants for construction machinery the company says, the principle has been used in aircraft engines. The 175A shovel with 2¼ cu yd bucket capacity, weighs 24,100 lb. It has 4-wheel drive and rear-wheel steering and features the Clark-engineered power train torque converter, power shift transmission and planetary-wheel drive axles. The three-to-one torque multiplication provided by the converter makes an increased flow of power available when needed says the company. Elimination of a clutch removes the chief cause of both operator fatigue and maintenance problems, it adds. The shovel has four forward and reverse speeds and reaches a maximum speed of 27 mph. The planetary-wheel drive axles reduce torque on the axle shafts 70%, according to the maker.



Metallic-Faced Discs Feature Of Oil Clutch For Tractor

A new oil clutch designed for its D4 tractors is being sold as an attachment by Caterpillar Tractor Co., Peoria, Ill. Also designated the D4, the clutch is similar in design to oil clutches in the company's D6, D7, D8 and D9 tractors. It features metallic-faced clutch discs, a self-contained gear-type pump and an oil supply clutch brake for gear shifting. The three metallic-faced plates on the new D4 oil clutch are separated by oil films at all times except for the last revolution or two as the clutch is engaged. Thus, says the company, there is little opportunity for wear and heating. The oil system includes an oil pump with screened inlet and passages that carry oil to all parts of the clutch. Oil enters the inner diameter of the clutch plates and circulates between them by means of grooves in the clutch facings. Caterpillar says the clutch is especially desirable for jobs where frequent engagement, disengagement and flywheel clutch slipping are necessary.

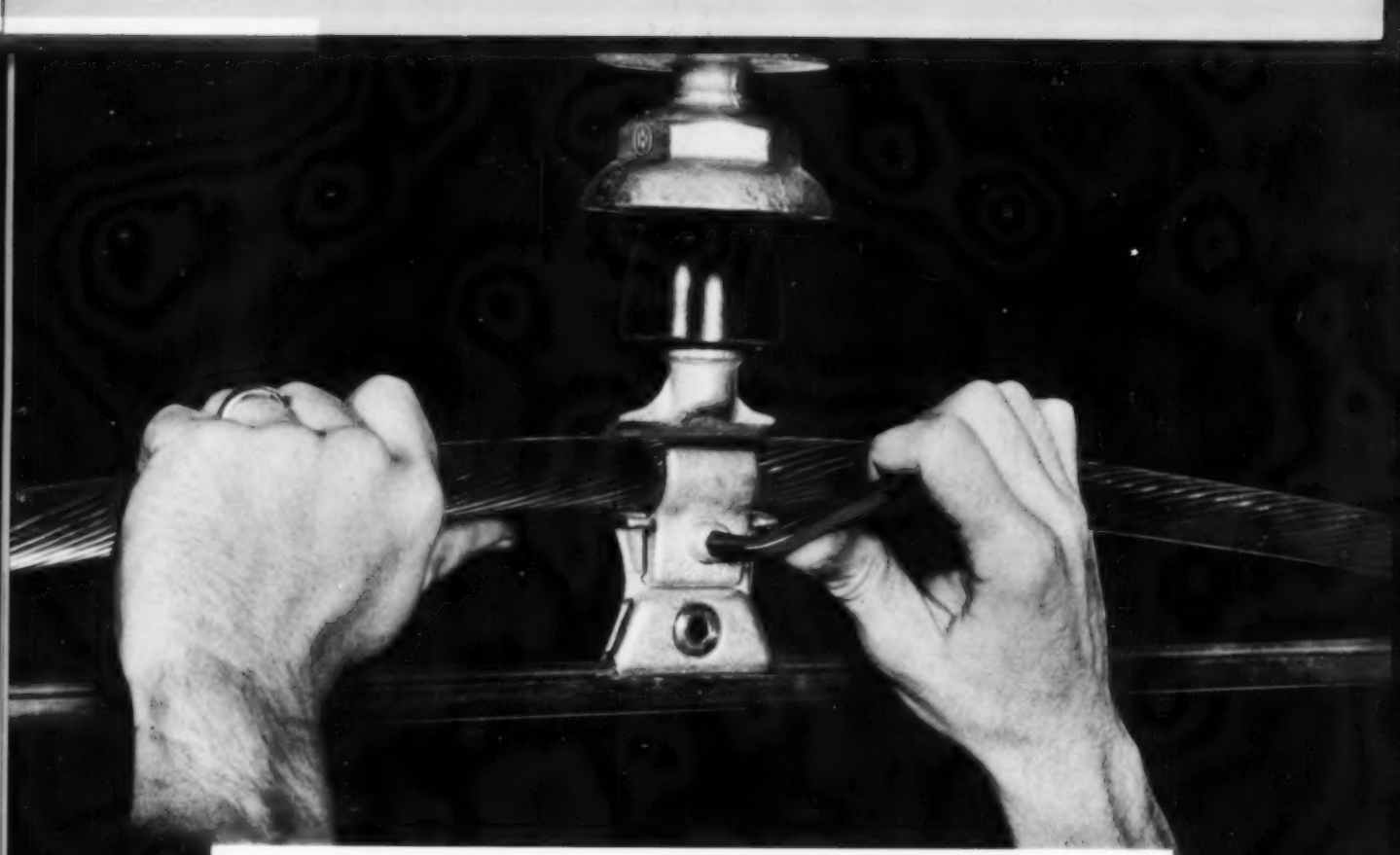
Tire Combines Wire, Textiles

United States Rubber Co. has announced a new line of passenger car and truck tires that contain from one to eight miles of flexible steel wire. The company says that steel wire makes a tire tread rupture-proof, doubles cut resistance and permits a tire to run from 20 to 40 deg cooler.

It marks the first time that a major rubber manufacturer has used wire successfully in a passenger car tire although tire engineers have been experimenting with it for more than 20 yr. Although there are wire truck tires being sold now, the manufacturers have used wire in place of textiles. U. S. Rubber has used wire in addition to textiles.

Freezeproofing In Trucks And Railroad Cars

A low-cost concentrate, "CEMKOTE," may be cut back with two or three parts of low-pour-point fuel oil to provide a sprayable coating for the insides of truck bodies and railroad cars to prevent freezing of materials to the sides and bottoms of the carriers. Companies now using this product of the Sta-Vis Oil Co., St. Paul 1, Minn., apply the oil-diluted material through an electronic-eye-actuated spray nozzle which is mounted on an arbor above the travelway.



Double suspension . . . *in half the time!*

Feeder-trolley goes up faster with this O-B combination clamp!

Separate clamping pieces hold feeder cable and trolley wire. Feeder clamping piece opens into sling to hold cable during tensioning.

String trolley wire first, follow up with feeder cable as it's needed—using just one fitting, just one tool (a hex wrench) for both jobs.

Three sizes accommodate 4/0 to 1,600,000 cm feeder cable, all three hold any size trolley wire.

For 4/0 to 500,000 cm feeder	Catalog 22465
For 750,000 to 1,000,000 cm feeder	Catalog 22466
For 1,200,000 to 1,600,000 cm feeder	Catalog 22467

Hollow Screw Clamp
Catalog 16227

Ohio Brass

MANSFIELD OHIO, U. S. A.

IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

Feeder and Trolley Materials • Control Materials • Trolley Shoes
Roof Bolt Shells and Plugs • Rail Bonds • Automatic Couplers

Hollow Screw Splicer
Catalog 22270

Bolting teams move faster . . .

when they're working with O-B shells and plugs!

How do you speed up the bolting cycle when you give a team O-B shells and plugs?

If you want a quick answer to that question, watch a team like this in action with O-B units.

See how quickly the O-B shell and plug unit is spun on the bolt—no false starts, no delays due to off-size threads.

See how it's shoved up the hole in one swift motion—no hanging up half way.

Notice how it stays put once it's in the hole—doesn't have to be held to keep it from falling out.

Then count the seconds it takes to pull it tight—see how fast it sets up in the hole without slipping or revolving.

Stay a little longer to prove to yourself that bolting teams *do* swing into a fast-moving, rhythmic cycle when they work with this trouble-free O-B unit.

Then go back to the storeroom and make sure you have an ample stock to keep the team moving this way!

⅝-inch Bail-Type 22463
¾-inch Bail-Type 22378

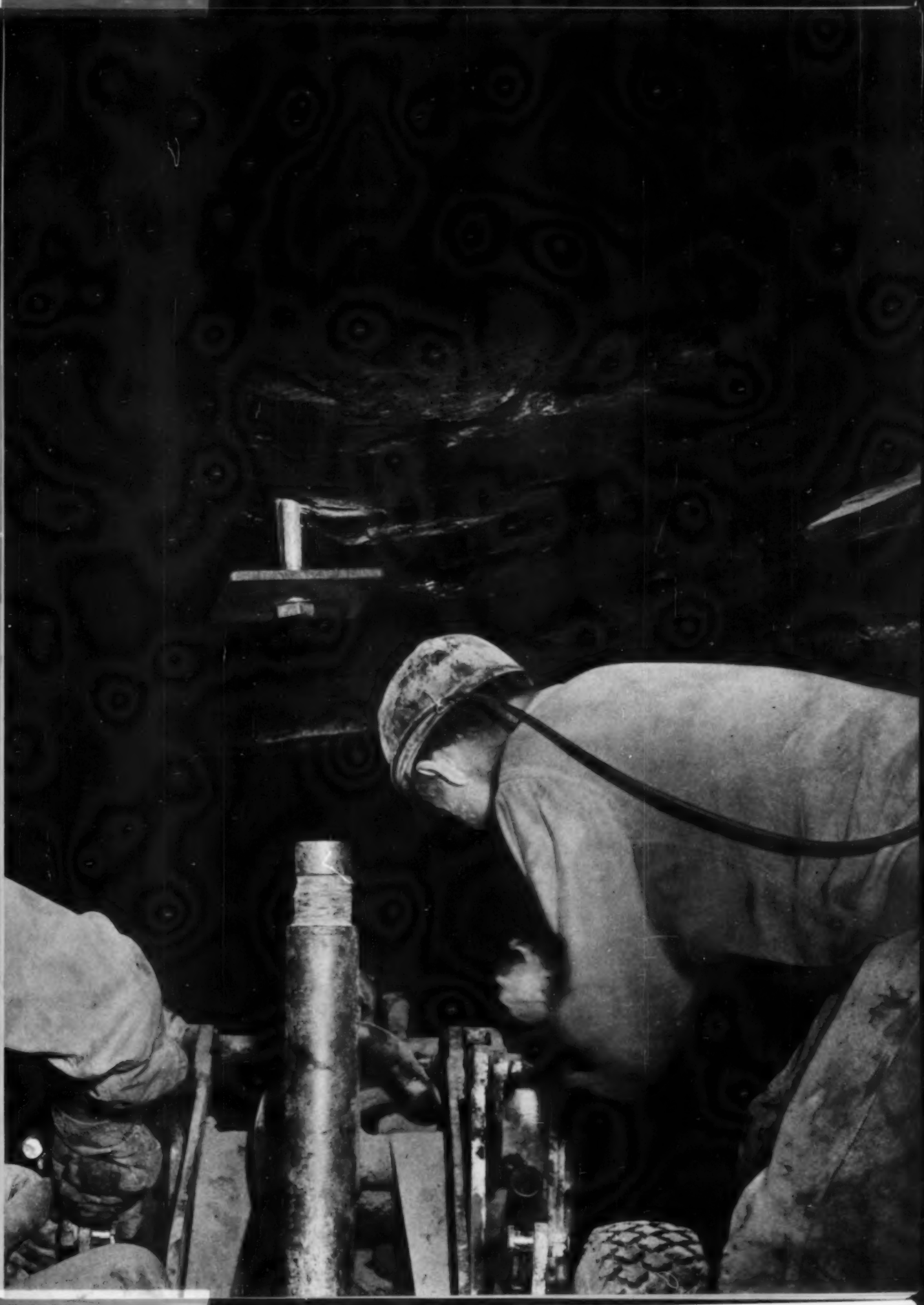
Ohio Brass

MANSFIELD OHIO, U. S. A.

IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

Feeder and Trolley Materials • Control Materials • Trolley Shoes
Roof Bolt Shells and Plugs • Rail Bonds • Automatic Couplers

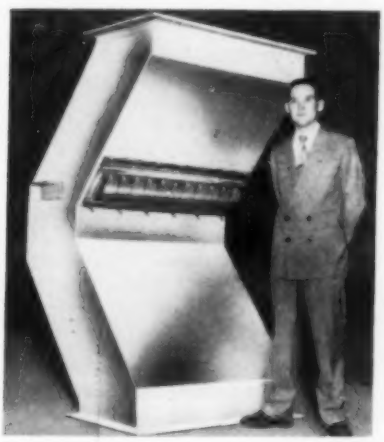
⅝-inch Standard 21890
¾-inch Standard 21889



280 HP Diesel Powers Bottom Dumper

A hydraulically operated bottom dump motor wagon, the TW0360, has been added to the earthmoving and construction machinery line of Allis-Chalmers Mfg. Co., Milwaukee, Wis. A 47,000-lb unit, the wagon is powered by the company's 280-hp diesel engine. It is equipped with forward speeds ranging from 3 mph in first to 20 mph in fourth gear at 2,100 rpm. Reverse speed is 3.1 mph, according to the manufacturer.

The motor wagon, with a 22-ft wheel yd base, has a 22 cu yd heaped and a 17 cu yd struck capacity, or 26 tons. It is 35 ft 10½ in long, 11 ft 3¾ in wide and 10 ft 1½ in high. When loaded the TW-360 has a 22¼ in front axle clearance. Its hopper when empty has a 31½ in ground clearance, 29½ in when loaded. Clearance with doors open is 20½ in.

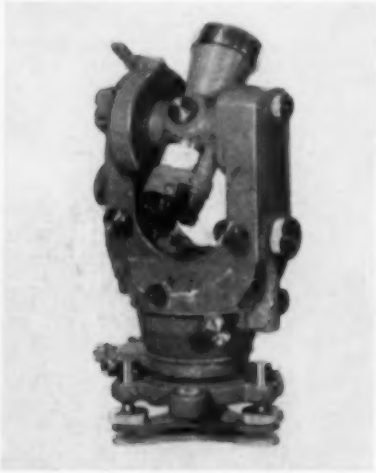


Materials Travel Reversed In Chute Metals Trap

A "zig-zag" magnetic chute that the manufacturer says is not only capable of removing an occasional nut or bolt, but also fine slivers of metal that normally wear off processing machinery, is being sold by the Prater Co., Chicago, Ill. Designed for gravity flow or finely crushed products, each chute assembly contains two permanent magnetic separators. The chutes are so constructed that material first passes across one magnet then reverses its direction of travel to pass across a second magnet. The permanent magnets are hinged so that trapped pieces of metal can be cleaned off by swinging the magnet open. The entire assembly is welded, designed to be dust tight and is made for gravity flow only. It is available in 8 to 48-in widths.

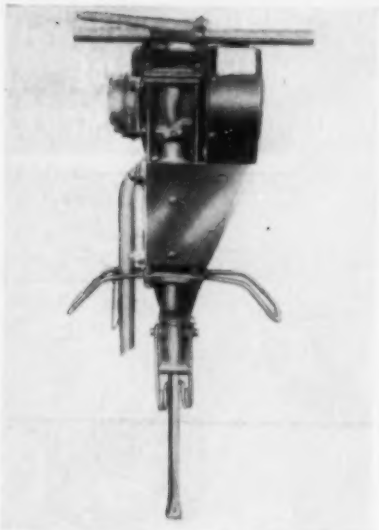
Floodlamp's Life 2,000 Hrs

Development of a 300-w standard voltage flood lamp, the PAR-SL, that produces a rectangular beam has been developed by General Electric Co. The flood lamp is an all-glass, hermetically sealed, self-reflecting globe and resembles the sealed beam auto headlight. Approximate initial candlepower is 10,000 in the central zone of the new lamp's beam. Rated life is 2,000 hr.



Transit Reads Direct to 20 Sec

A recent addition to the Wild Heerbrugg instrument line is model Wild T-1, an optical repeating transit with direct readings to 20 sec and easy interpolation to 10 sec on both horizontal and vertical circles. Compared to the standard Wild instrument, which reads directly to one minute with estimations to six seconds, the new model's minute graduations on the micrometer scale are subdivided into three units. The Wild standard model is $700, the new model is $718. Complete information from Wild Heerbrugg Instruments, Inc., Main & Covert Sts., Port Washington, N. Y.



Drills 2 Ft in Minute

A self-contained gasoline hammer rock drill has been added to the power tool line of Syntron Co., Homer City, Pa. The model, RD-55, can drill to thirteen ft at a rate of some two feet a minute when using Syntron's hollow drill steels with carbide tips. In addition to automatic rotation of the drill steel, air compressed by the reciprocating hammer or striking piston blows dust and cuttings out of the hole, the maker says. Three sets of drill steels are available with the new model. Short sets use 2-, 4-, and 6-ft steels with 1 3/16 to 1⅜-in diameter bits. The long sets use 8-, 10-, and 12-ft steels with 1 3/16 to 1¼-in diameter bits.

Identical Diesel Engine Serves Shovel, Crawler Tractors

Allis-Chalmers, Milwaukee, Wis., has announced two diesel-powered units, the 12,400 lb HD-6 crawler tractor and the 19,600 lb HD-6G tractor shovel with a rated capacity of 1⅛ cu yd.Both units are powered by Allis-Chalmers' HD-344 diesel engine, a four-cylinder, four-cycle unit that develops 57 net flywheel hp, 45 hp at the drawbar and 55 hp at the belt. In the HD-6 maximum drawbar pull is some 12,650 lb. It has five forward speeds from 1.5 mph in first, 5.5 in fifth gear and 2 mph in reverse. The HD-6G has four forward speeds from 1.5 to 5.5, and two reverse speeds from 2 to 4.1 mph.

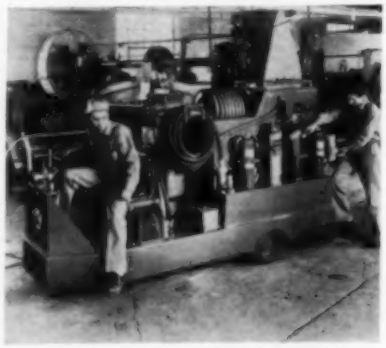
The HD-6 is equipped with heat-treated track shoes, positive seal roller

bearing truck wheels, idlers and support rollers that require lubrication once each 1000 hr of operation and a 24-v electric starting and lighting system.

The HD-6G, in addition, is equipped with six truck wheels a side with 83⅜16 in of track on the ground, 1½ cu yd two position bucket, a new shovel hydraulic system, semi-grouser track shoes, heavy duty front idlers and a pusher fan.

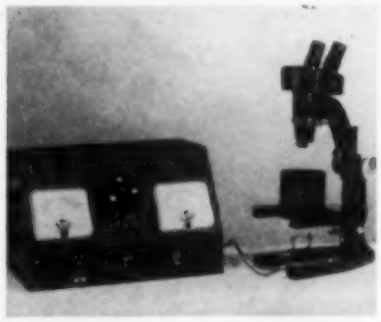
Neoprene Insulation Increased

Western Insulated Wire Co., Los Angeles, Calif., has begun manufacturing a line of portable electrical cords and cables named "Bronco 66 Certified." The outer protecting jackets contain at least 67.32% new neoprene. The neoprene increase is a greater protection, says the company, against an industrial environment that attacks portable power cables, e.g., oil, abrasion, flame, acids and heat. Jackets are branded every two feet. Vulcanized into the outer jacket are the product name, neoprene content, type, size, number of conductors, rated voltage, and "P116BM." The last symbol denotes official approval by the Pennsylvania Department of Mines and acceptance for listing by the Federal Bureau of Mines.



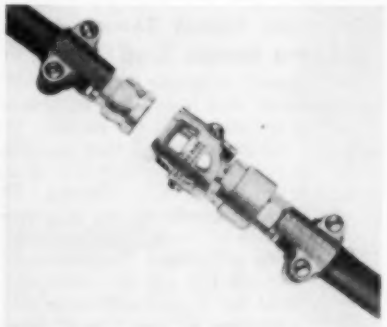
Plant Fire Trucks Equipped With Chemicals, Fog Units

A line of mobile in-plant fire trucks is being distributed by the Ansul Chemical Co., Marinette, Wis. Equipped to carry an assortment of fire fighting equipment and designed for plant fire brigades, the trucks are manufactured by St. Clair Industries, Detroit, Mich. They are being made in six basic models. The KB 8 model, featuring a 300 lb Ansul dry chemical unit backed up by a 150 gal water fog system, is expected by the company to find the widest application in industry. Other units utilizing dry chemical-carbon dioxide combinations, water fog-carbon dioxide combinations or water are available. The units are sold on either a 3-wheeled 42 in wide chassis, suitable for in-plant use, or a 4-wheeled 48 in wide chassis with more road clearance and a larger engine for indoor and outdoor use. The 300 lb Ansul dry chemical unit comes equipped with 100 ft of hose. The pump of the 150 gal water fog system is driven through a power take-off by a 14.6 hp Wisconsin engine that powers the truck. This makes possible 300 psi for fog making and delivers 16 gpm. The trucks are 10 ft long and 5 ft 8 in high. Prices range from $4,453 to $4,878.



Micro-Furnace in Production

A new micro-furnace, Model MF-1, is being manufactured by the Elizabeth Instrument Co., P. O. Box 288, Elizabeth, N. J. It is particularly suited, the maker says, to ash fusion and melting point temperature determinations, micro-separation and sintering studies. The specimen being studied is under direct observation by a stereoscopic microscope at all times. Temperature readings are performed simultaneously. The furnace will heat to 2000 F in 45 minutes. No special training is required to install and operate says the company. The furnace consists of a furnace unit, control console, microscope and illuminater.



Globe Valve, Vent Redesigned

A globe valve designed for liquid-immersed electrical transformers has been developed by the Crane Co., Chicago, Ill., industrial sales division. The valve, No. 121, is made in ¾, 1, 1½ and 2-in sizes and is rated at 150 lb maximum pressure at 200 deg F maximum temperature.

The company has also redesigned a vent and sampling valve, No. 211, de-

B.F.Goodrich

125,000 MILES and 3 recaps cut tire costs at Colonial Coal Corp.

PITTSHAW Trucking Co. trucks are equipped 98% with BFG tires.

THESE TIRES have seen 1200 hours' service at Eagle-Picher mine.

CLINCHFIELD Corp. says Traction Express tires wear "almost indefinitely."

How these miners cut tire costs —and how you can, too!

THESE four mining companies—all in different parts of the country—have one thing in common: they're saving money through the outstandingly long service they get from B. F. Goodrich tires.

The Colonial Coal Co. in Kentucky reports 125,000 miles and 3 recaps from Universal tires. Clinchfield Coal Corp. in Virginia often got only 30 days' service from other makes of tires, reports B. F. Goodrich tires can be recapped. "BFG tires are better than any we've ever used," says Pittshaw Trucking Co., Pennsylvania coal hauler. And down in Oklahoma, the Mining & Smelting Division of Eagle-Picher Co. reports recaps give 75% of original mileage.

All-Nylon body

You can get money-saving service like this, too, particularly with B. F. Goodrich *all-nylon* tires. Nylon is stronger than ordinary cord materials, withstands double the impact, and resists heat blowouts and flex breaks. The B. F. Goodrich *all-nylon* tire body outwears even its extra-thick tread, can still be recapped over and over!

Your B. F. Goodrich retailer has a money-saving tire for every mining job. Call him today and start getting longer, trouble-free tire service. The address is listed under Tires in the Yellow Pages of your phone book. Or write *The B. F. Goodrich Co., Tire & Equipment Division, Akron 18, Ohio.*

Specify B. F. Goodrich tires when ordering new equipment

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

POWER SHIFT
NO CLUTCH
TORQUE CONVERTER

HUBER-WARCO 5D-190 (195 H.P.)

POWER!

Tough grading jobs are handled easily and quickly by this 31,450 pound motor grader, powered by a 195 h.p. General Motors diesel engine.

PERFORMANCE!

An Allison Torque Converter protects the unit from shock loads while a full power-shift transmission — WITHOUT CLUTCH — permits quick shifts under full load without interrupting power flow from engine to load. A tail shaft governor automatically adjusts engine RPM to meet any load condition, at any speed set by the operator. Power sliding moldboard is standard equipment.

PROFIT!

These power and performance features have been combined to increase the working capacity of the 5D-190 and reduce costly down-time. With this motor grader it is possible to move more material, with fewer passes. This increased working capacity will add more profit to every job.

For more information write for Huber-Warco 5D-190 literature — Bulletin HWG-508 and Bulletin HWG-510.

For More Details — See Your Huber-Warco Distributor

SEE YOUR NEAREST HUBER-WARCO DISTRIBUTOR

HUBER WARCO

HUBER-WARCO COMPANY

MARION, OHIO, U. S. A.

Road Machinery

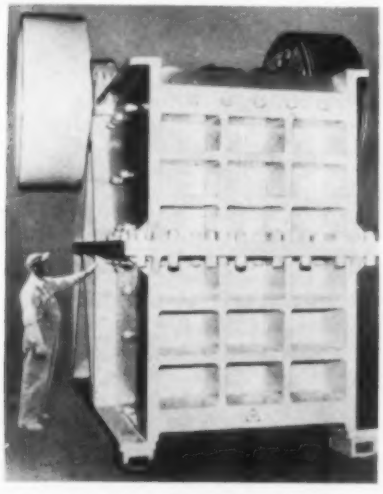
CABLE ADDRESS: HUBARCO

ROAD ROLLERS • MOTOR GRADERS • MAINTAINERS • GRINDERS

veloped for use with the No. 121 globe valve. When installed at the top of liquid-immersed electrical equipment, the No. 211 can be used as an air vent. Installed at a low point, it is used as a valve to draw off samples of the liquid. The vent-valve is recommended for 400 lb maximum pressure and 200 deg F maximum temperature.

Visor Gives Face Protection

A clear acetate visor that gives frontal and side face protection against abrasive particles, flying objects and chemical splashes, has been developed by Mine Safety Appliances Co., Pittsburgh 8, Pa. Named the "M-S-A Skullgard-Faceshield," the visor can be attached in seconds to any M-S-A protective hat. An aluminum pivot arm permits the shield to be swiveled up or down in any desired position and the visors can be detached from the pivot arm for replacement. The company's Bulletin 0302-4 gives more information.



Jaw Crusher Developed To Reduce Drilling, Shooting

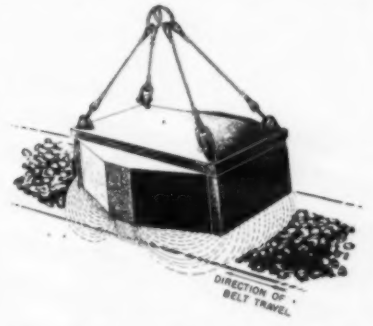
Denver Equipment Co., P. O. Box 5268, Denver 17, Colo., has introduced a 36x48-in Denver Type "J" jaw crusher to meet operators' primary crushing problems, particularly where underground crushing can effect savings through reduced drilling and shooting. Sectionalized to handle component parts during installation, the frame is electric-welded 3 in steel plate. Both sections of the crusher frame were stress-relieved before machining. A heavy box-section swing jaw is made of cast steel and the shaft of the crusher rotates in oversize double roll, self-aligning spherical roller bearings placed close together to prevent shaft deflection. The crusher has an estimated capacity of 275 to 750 tph, depending on the kind of rock and a variable 4- to 10-in discharge setting.

Gear Lube Resists Oxidation

D-A Lubricant Co., Inc., Indianapolis, Ind., has announced "D-A Torque Fluid," a lubricant designed specifically for year-round use in Allison "Torqmatic" drives. The fluid meets and exceeds Allison's specifications for hydraulic transmission fluid, type C, says the maker, who adds that the lubricant resists oxidation during long hours of service at high temperature and will not thicken or develop sludge.

Blade Saws Toughest Metals

A high speed steel blade designed for a portable electric band saw cuts most tough metals, says its maker, Porter-Cable, Syracuse, N. Y. Specifically designed for use with model 524, a "Porta-Band" saw, the blade cuts stainless steel, carbon tool steels and nickel.



Magnet Traps Fast-Moving Iron

The Ohio Electric Mfg. Co. offers a new line of rectangular separation electromagnets for removing tramp iron and undesirable magnetic particles. Named "Super Magnetomotive," the magnets have been designed for mines, quarries, foundries or smelters.

The manufacturer says that the magnet's rectangular field is especially suitable for suspension over the head pulley of a conveyor belt. It will, says the maker, lift tramp iron out of heavy or wet burdens, or burdens moving at speeds up to 500 ft a minute. Models vary in strength from the SM20's effective range

of 6 in at a belt speed of some 200 ft a minute to the SM60's range of 19 in at a belt speed of approximately 300 ft a minute.

Levers Replace Gears In Chain-Hoist Reduction

Two light coil-chain ratchet-lever hoists have been introduced by Coffing Hoist Div., Duff-Norton Co., Danville, Ill. The models, L-1½ (1½ tons) and LD-3 (3 tons) have been added to the company's "Super Power" 2½-ton and 5-ton line. Reduction in all four hoists is achieved with compound levers instead of gears. This feature, says the company, has these advantages: 1. "Super Power" hoists, with 85% efficiency, take 60½ lb of handle pull to lift a 1½-ton load and 74 lb to lift 5 tons. 2. Fewer gears and chains are a load-holding safety factor.

The hoists are made in iron or aluminum alloy. Model L-1½ is malleable iron, weighs 26½ lb, 20 lb in aluminum. Model LD-3 weighs 34½ lb in iron, 28 lb in aluminum. The hoists are tested at 100% above capacity and can be torn down in the field for servicing. Model L-1½ is single-chain unit with a standard lift of 56½ in and a minimum distance of 14 in between hooks. The double chained LD-3 has a standard lift of 57 in and a minimum distance of 18½ in between hooks.

Trailer Dumps Built With Eye On Weight Laws

Three trailer dump models, two of them tandem-axle designs, the third a single-axle design, have been introduced by Galion Allsteel Body Co., Galion, Ohio. Tandem-axle Model STM is recommended for use where weight laws establish a medium gross weight limit and allow credit for only one set of tandem axles. Model TTM, also a tandem-axle dump, has been designed for areas where highway weight laws allow maximum credit for two axles. Model SSM, a single-axle dump, is recommended where weight laws allow high individual axle-weight limits combined with low gross weight. The tandem-axle trailers are 19 to 24 ft long and carry from 10 to 36 cu yd. The single-axle models are 16 to 20 ft, carry 10 to 20 cu yd.

Develop Control Valve Coupling

C. B. Hunt & Son, Inc., Salem, has produced what it calls "Quick-As-Wink" valve couplings designed to give an operator complete control of an air line. The couplings permit line air to be shut off and tools changed safely and quickly. They are being made in ¼-, ⅜-, ½- and ¾-in sizes for line air up to 250 psi. Any size valve half can be connected to any size connection half. More information in Bulletin 551 from the company.

Volt-Ammeter Line Expanded

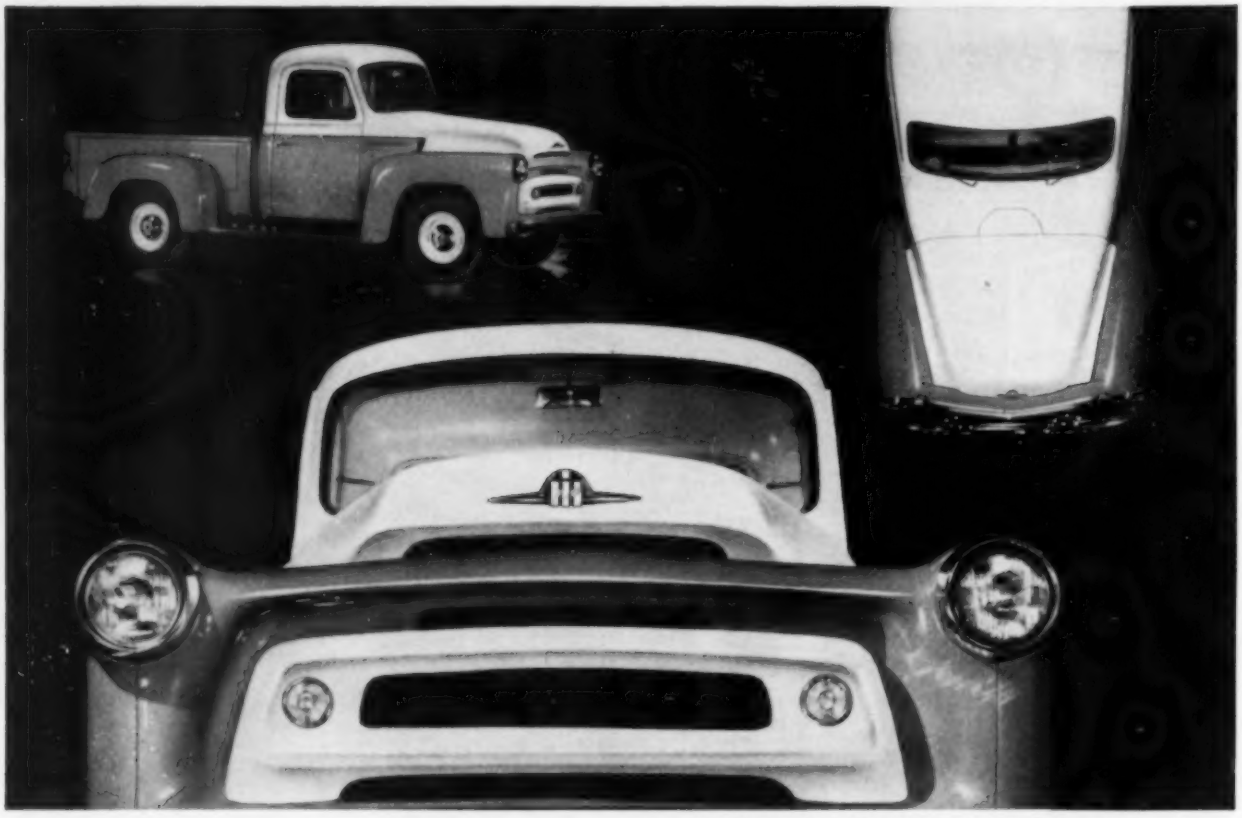
Three high voltage "Amprobe Junior" models have been added to the Pyramid Instrument Corp. line of volt-ammeters. Model 300 is designed for general work. It covers six ammeter ranges up to 300 amp and three voltmeter ranges up to 600 v. Its tapered probe jaws have been designed for hard-to-get-at wires in crowded switch boxes. Models 600 and 1200 have been designed to handle loads up to 600 and 1200 amp ac.

Equipment Shorts

STEEL RACK—Pollard Bros. Mfg. Co., Chicago, Ill., is manufacturing a vertical bar stock rack that is designed to stand against a wall. Suited for storage purposes where space is limited, the rack will store bars up to 12 ft long. It

new style! new comfort! new power!

new Internationals!



New INTERNATIONAL "S-line" includes light, medium and heavy-duty models from 4,200 to 33,000 lbs. GVW, with 10 gasoline and LPG engines, every modern truck feature.

Functionally styled for practical good looks!

Here are the new INTERNATIONALS . . . a great new truck line from *any* point of view! Their clean-lined styling is trim and functional — designed to take the rough going of truck work without excessive repair costs.

Driver designed for real comfort!

They give you real comfort, too! They're driver-designed to let you work longer without fatigue. Loaded with performance and handling features that make hauling jobs easier.

More usable horsepower for BIG money savings!

These great INTERNATIONAL trucks offer more horsepower — develop their power for sustained operation at lower, more economical engine speeds. They're *all truck* with no passenger car engines or components asked to do a truck job. That saves you the BIG money — the over-the-years operating and maintenance money. Drive them today, at your INTERNATIONAL Dealer or Branch.

You relax in REAL comfort in Comfo-Vision cabs. Comfort-angled steering wheel. Low hood for closer view ahead. "Quiet-ride" roof lining, draft-free doors. Choice of 24 solid and optional two-tone exteriors. Optional deluxe cabs have color-keyed interior, chrome trim.

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Motor Trucks • Crawler Tractors • Industrial Power
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Observe SAFE DRIVING DAY, Thursday, December 1 . . . Drive Carefully Always

is 24x36x84 in and weighs 140 lb. Constructed with three 12-gage steel shelves and with angle iron spacers, the framework is arc-welded. The rack itself is assembled with bolts.

LEVEL CONTROLLER—A level controller that combines the advantages of electronic and air-pressure control instruments has been developed by Fielden Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. Fourth St., Philadelphia, Pa. The device named "Pneutronic" level control, utilizes electronic capacitance sensing elements to detect minute changes in levels in tanks, drums, process baths, pipelines and other conveyors. Servo motors and other rebalance mechanisms are eliminated, according to company engineers.

Free Bulletins

MATERIALS HAULER—Since being introduced as a power wheelbarrow for construction work, a series of improvements has turned the "Moto-Bug" into an all-around materials-handling device, according to the Kwik-Mix Co., Port Washington, Wis. An 8-p catalog describing the machine and its interchangeable attachments is available from the company. The catalog illustrates a 3-wheel model, S-10, and a larger-load-carrying 4-wheel model, R-15.

MAGNETIC PLATES—Features and applications of permanent magnetic plates are described in Bulletin PL-250 being distributed by the Homer Mfg. Co., Dept. 59, Lima, Ohio. By automatically removing tramp iron from materials transported by pipes, chutes, belts and all other types of conveyors, the plates protect product quality, protect processing machinery and guard against fires and explosions caused by tramp-iron sparks. The bulletin includes application diagrams, performance data and descriptions of the company's magnetic plates.

LUBRICANTS—Bulletin 105, a leaflet describing two lubricants, Types 165X and "LOEX," is available from the Alpha Molykote Corp., 65 Harvard Ave., Stamford, Conn. Type 165X is an extreme-bearing-pressure open-gear lubricant. It was developed not to crack or peel at temperatures as low as 0 F. Type "LOEX" is suited for extreme low-temperature applications, the company says.

ASBESTOS INSULATION—A booklet that describes performance tests of asbestos wire and cable insulation applied in felted-wall construction is being distributed by Rockbestos Products Corp., New Haven, Conn. Its number and name are RSS 88, "Specifications for Asbestos Varnished Cambric N.E.C. Type AVA Lighting Wires and Power Cables." Rockbestos standards for such test characteristics as minimum permissible breakdown after an initial dielectric test, minimum breakdown during immersion, minimum permissible dielectric strength

after bending, and surface leakage requirements are covered.

SLINGS—An expanded edition of Union Wire Rope's 60-p sling handbook describes new developments in "Tuffy" slings. The foremost, says Union Wire, is a streamlined, heavy-walled, steel-ferrule eye splice. Machine-braided fabric and ferrule metal are pressed on under such tremendous pressure that the metal virtually flows into the interstices of the fabric.The booklet also contains a rigger's manual, a shop chart of proof-tested ratings and a number of illustrated features. From Union Wire Rope Corp., 2100 Manchester Ave., Kansas City, Mo.

ELECTRONIC CONTROLS—A bulletin describing electronic controls is being distributed by the Dynamatic Div., Eaton Mfg. Co., Kenosha, Wis. It contains non-technical, simplified information about installation, performance and maintenance of the basic Dynamatic electronic control. The principles utilized to accomplish stepless speed control of Dynamatic Eddy-Current rotating equipment, using an A-C line as the power source, are described in detail. Bulletin EC-1.

STEEL SIDING—Ryerson Steel's Bulletin 70-5 describes mansard-patterned stainless-steel siding for single-sheet and sandwich-wall building construction. The bulletin includes test data, fastening methods and recommendations for using the siding. Joseph T. Ryerson & Son, Inc., P. O. Box 8000-A, Chicago 80, Ill.

METAL HOSE—Corrugated flexible metal hose of annular and helical construction is the subject of Bulletin 20-E being distributed by the Atlantic Metal Hose Co., Inc., 308 Dyckman St., New York 34, N. Y. Steel and bronze hose, with or without wire braid, couplings and assemblies, are described. Engineering data includes bending radii, bursting pressures and weights. A number of uses are also listed.

RUBBER HOSE—Specifications for 68 different rubber hoses for industrial and agricultural uses are described in an 8-p digest printed by the Industrial Rubber Div., Thermoid Co., Trenton, N. J. Several hose types are new additions to the Thermoid line. The digest also contains data on nine types of conveyor belts and seven types of flat power-transmission belting.

V-BELT DRIVES—A 74-p booklet containing tables designed for quick selection of "Texrope" V-belt drives has been printed by Allis-Chalmers. The booklet also illustrates design features, basic driven principles and technical data on sheaves. "Tex-Book," 20P40, Allis-Chalmers Mfg. Co., 968 S. 70th St., Milwaukee, Wis.

GENERAL LUBRICANT—A general-purpose grease able to withstand extreme bearing pressure, according to the company, is described in Bulletin 101 by The Alpha Molykote Corp., Stamford, Conn., 65 Harvard Ave., Stamford, Conn.

ONE GREASE ALONE

now handles practically every job in your plant

Improved POCO HT Grease is ideally suited for applications subject to extreme temperatures, moisture, speed and load.

Here's why:

- It has a higher melting point than most special "high temperature greases".
- It can be pumped at temperatures as low as —20° F.
- It lubricates completely under conditions of moisture and water.
- It has higher oxidation stability for longer life on the job.
- It provides extremely high protection against rust and corrosion.

Let your local Pure Oil representative tell you how improved POCO HT can cut lubrication costs for you. This may be the only grease you need in your entire plant. Why not call now and find out?

Now it's easier than ever to "Simplify and Save" With improved POCO HT headlining Pure's Multi-Purpose lubricants, you can now save more than ever with Pure's "Simplify and Save" Plan. Find out how it will work in your plant. Write for full literature. The Pure Oil Co., 35 E. Wacker Drive, Chicago 1, Ill.

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Sales offices located in more than 500 cities in Pure's marketing area.

PURE MULTI-PURPOSE LUBRICANTS

"Molykote" Type BR2, a lithium-base grease, contains a "Microsize" powder. Its ten "special" qualities are listed by Molykote.

INSULATING SYSTEM—"Silco-Flex," an all-silicone and rubber insulating system for motor and generator stator windings, is described in a new 4-p leaflet published by Allis-Chalmers. The leaflet features "Silco-Flex" insulation's electrical, thermal, mechanical and chemical properties. Leaflet 05R-8341, Allis-Chalmers Mfg. Co., 968 S. 70th St., Milwaukee, Wis.

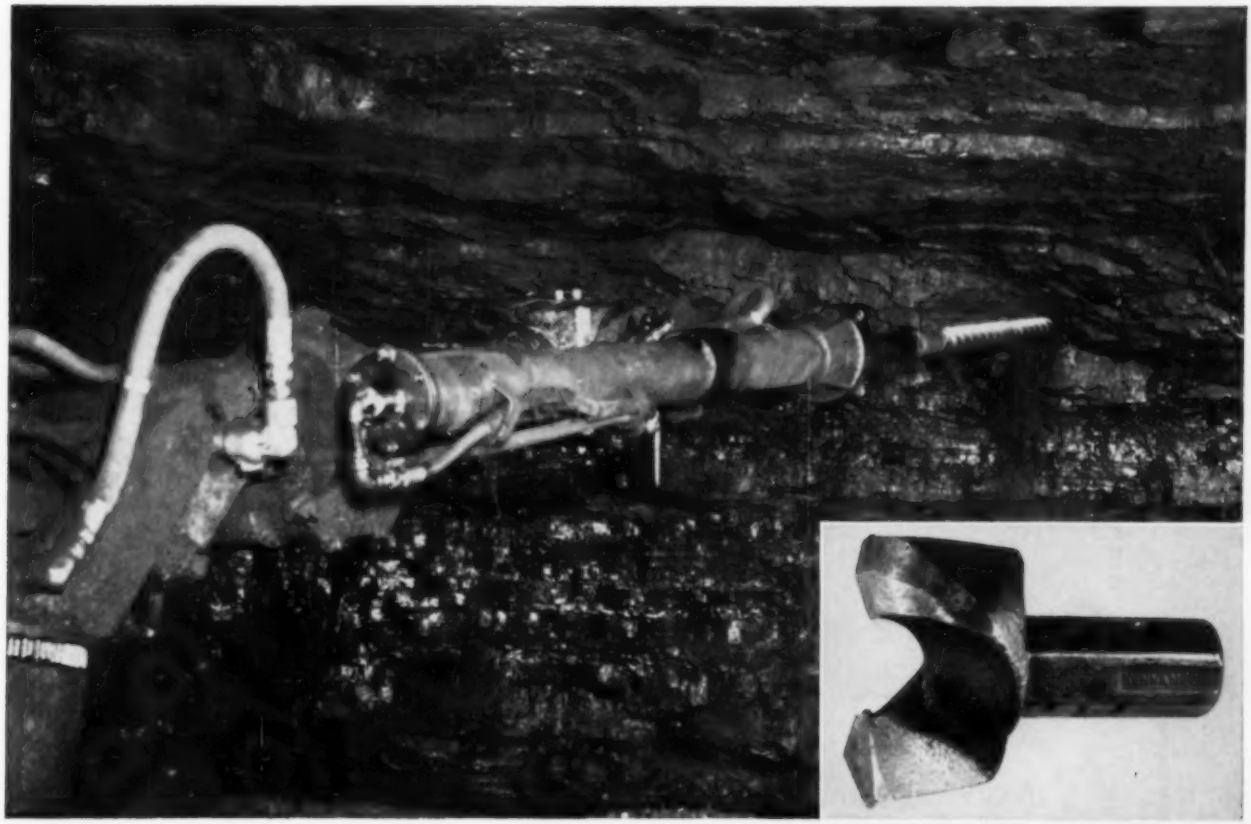
METAL HOSE DATA—Use and application data on Universal's flexible metal hose is the chief offer in the company's new reference manual. The information covers bronze, carbon-steel, monel-nickel or stainless-steel hose and shows types that will compensate for such conditions as varied pressure, heightened temperature, motion and vibration. Catalog U-333, Universal Metal Hose Co., 2133 S. Kedzie Ave., Chicago 23, Ill.

BLOWER—Read Standard's folder, B-154, describes the "Standardaire," and axial-flow, positive-displacement blower that takes in and discharges air from pockets that form between intermeshing male and female rotors during rotation. The rotors operate with a clearance of a few thousandths of an inch, and have been designed not to touch. The folder includes a cutaway photo of the interlocking main and gate rotor assemblies. Read Standard Corp., 370 Lexington Ave., New York 17, N. Y.

TRAILER DUMPS—A 6-p catalog illustrating a line of "Transporter, Excavator and Hitchhiker" trailer dumps has been printed by the Galion Allsteel Body Co., Galion, Ohio. Models SSM, SSMF, STM and TTM Transporters; Models TTE and TTEF Excavators; and Model HH Hitchhikers are illustrated. Body cubic and payload capacities, hoists, chassis details, axle ratings and construction details are covered in detail. Catalog LL-1234.

POWER SHOVEL—A 16-p bulletin describing Bucyrus-Erie's 3-cu yd shovel has been printed by the company. The model can be converted to dragline, clamshell or lifting crane, according to the bulletin. The basic engineering features of the company's line of general-purpose excavators has been employed in its design. Bulletin 71-B, Bucyrus-Erie Co., S. Milwaukee, Wis.

HYDRAULIC BOOMS—An Ingersoll-Rand 12-p bulletin describes the company's hydraulic booms designed for the construction and mining industry. The bulletin covers Ingersoll-Rand's Hydra-Boom applications and contains information on tractor-mounted booms, tunnel jumbos and self-propelled air-operated rigs. Diagrams show the areas that can be covered by each boom, vertically and horizontally. Information about special mountings, such as, a four-boom, self-propelled machine for drilling an under-



This is the Kennametal DB-3 bit used at Gem Coal Company, which gave over 10,000 feet of drilling at a bit cost of 1.2 mills, using a variable speed, variable thrust Jeffrey 56-FHR single arm, rubber-mounted drill.

1706 six-foot holes drilled with a Kennametal* DB-3-Inch Bit

"One third longer service with Kennametal drill bits than any other carbide bit that has been used" . . . reports Herman Jauchius, Superintendent of Mine 255, Gem Coal Company, Nelsonville, Ohio.

As a typical example performance in this mine, a Kennametal DB-3 bit completed 1706 six-foot holes or more than 10,000 feet of drilling in Hocking Seam No. 6 with 28 regrinds. Drilling speed per six-foot hole, using a Jeffrey 56-FHR drill, averaged 20 seconds.

Approximately 190 places, 26 by 6 feet, are drilled per bit life, on an average, with production about 7100 tons of coal per bit. In terms of bit cost per ton, the Kennametal DB-3 bit cost $.0012 or 1.2 mills per ton of coal produced.

This is one example of why Kennametal bits are used so extensively. Try them in your operation and cut bit costs per ton of coal. Your Kennametal representative will help you put the right tool on the job. Call him today, or write to KENNAMETAL INC., Mining Tool Division, Bedford, Pennsylvania.

*Registered Trademark

Mr. Jauchius and face boss Fuller examine Kennametal drill bit, which has given long service and low bit cost per ton.

8874

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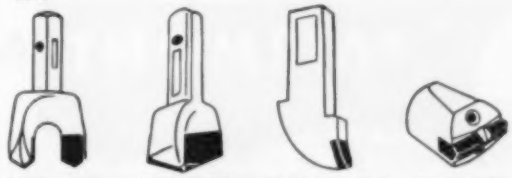

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- ★ *has had almost 60 years experience in the cleaning plant field*
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DESIGNERS AND CONSTRUCTORS OF COMPLETE COAL PREPARATION PLANTS USING BOTH WET AND DRY CLEANING, CENTRIFUGAL AND THERMAL DRYING.

ground face 40 ft high, is an added feature. Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

RESEARCH IN RUST—A report describing the rust penetration of Rust-Oleum after it has been applied to rusted metal surfaces has been printed by the Rust-Oleum Corp., 2799 Oakton St., Evanston, Ill. The report covers a series of tests by the Battelle Memorial Institute, Columbus, Ohio and describes in detail the preparation, procedures and evaluations of the tests. Briefly, the Institute tracked penetration with radioactivity and concluded that a Rust-Oleum protective coating penetrated rust "in measurable quantities." According to the manufacturer, the fish-oil-based product has an "unusual affinity" for rust, since traces of Rust-Oleum were found in the deepest pits of the steel used in the research.

WIRE ROPE ASSEMBLIES—A 24-p catalog, TL 500, describing Tru-Loc fittings and wire rope assemblies, is available from the American Chain & Cable Co., Inc., Wilkes-Barre, Pa. The catalog shows a number of standard Tru-Loc fitting and assembly combinations. One section covers special wire rope assemblies the company will manufacture to meet unusual requirements.

HOME, OFFICE SAFES—A line of small, insulated and fire-resistant safes for the business office and the home is described in a new 8-p folder printed by Remington Rand. The small safes, according to the folder are equipped to withstand fire, impact, explosion and burglary. Copies of SC-773 from Remington Rand Div., Sperry Rand Corp., 315 Fourth Ave., New York 10, N. Y.

LABORATORY AID—Denver Equipment Co. has printed a 76-p catalog, LG3-B10, entitled "Denver Laboratory Equipment." It describes some 146 items designed to help establish laboratory testing needs. Included is an explanation of the company's laboratory divisions: e.g., crushing, batch-testing and analytical laboratories. The catalog also carries a list and description of Denver Equipment's batch and continuous testing equipment for crushing, screening, grinding, flotation, gravity concentration, cyanidation, amalgamation and assaying. P. O. Box 5268, Denver 17, Colo.

EQUIPMENT FROM GERMANY—Several new bulletins decribing the Humboldt dust collector, hammer mill, pneumatic jigging machine, air-sizing systems and balanced-mass resonance screens are available from Klockner-Humboldt-Deutz AG, Koln, Germany. All are colorfully illustrated with the manufacturer pointing up features of the products with schematic drawings and photos. New designs and innovations have been made in much of the equipment. The dust collector, for example, is a cyclone-type of special shape and small diameter that the company says has proven itself in underground tests.

NEWS ROUND-UP

NCA ATOMIC ENERGY COMMITTEE: (front, left to right) R. E. Salvati, president, Island Creek Coal Co., Huntington, W. Va.; K. A. Spencer, committee chairman, president of Pittsburg & Midway Coal Co., Kansas City, Mo.; A. R. Matthews, president, Pocahontas Fuel Co., Inc., Pocahontas, Va., and George H. Love, president, Pittsburgh Consolidation Coal Co., Pittsburgh. (back, left to right) Joseph T. Berta, president, Pittston Clinchfield Coal Sales Corp., New York, N. Y.; M. L. Patton, vice president, Truax-Traer Coal Co., Cincinnati, Ohio, and R. H. Knode, chairman, Stonega Coke & Coal Co., Philadelphia, Pa. Committee member, L. Russell Kelce, president, Sinclair Coal Co., Kansas City, was not present when the photograph was taken at Bluefield, W. Va., Oct. 6.

Atom Energy No Monster To Coal Says NCA Committee Chairman

Coal and atomic energy may well become companions in the development of new uses for coal, Kenneth A. Spencer, chairman of the National Coal Association's Atomic Energy Committee, forecast last month after the first meeting of the committee in Washington.

Mr. Spencer, president of the Pittsburg & Midway Coal Mining Co., Kansas City, Mo., said that atomic energy would not swallow the coal industry since there "is not now a foreseeable plan where the costs of atomic generated electricity may be considered competitive with modern coal-fired plants. The use of atomic energy," he said, "will be determined on the basis of economics. Atomic energy," he added, "is not a monster."

But he declared that "with the advent of atomic energy as another source of fuel, coal faces new responsibilities. The committee," he said, "intends to continue to study the atomic energy program and to keep our industry well informed so that it may take action in its enlightened self-interest toward lowering its own cost of production, costs of transportation and improving its efficiency."

Mr. Spencer said that there should be "no slowdown in the construction of conventional power plants using conventional fuels." He declared that there has been "unwarranted optimism about the early availability of atomic generated power produced on a competitive cost basis." He called for atomic energy to be developed "within the framework of our free enterprise system, without subsidy." Subsidy would "create unfair competition for conventional fuels," he asserted.

The NCA atomic energy committee was established in September to study the influence of atomic energy on operations in the coal industry.

Also In This Section

Oil Derived 'Fluid Coke' To Fuel N. Jersey Power

Fluid coke, a new oil-derived material resembling black sand, will be used for the first time commercially as fuel to generate electricity, Public Service Electric & Gas Co., Newark, N. J., announced Oct. 20.

Made during the manufacture of gasoline in a new refinery process developed by Esso Research & Engineering Co., the new fuel will produce power for New Jersey homes and industries.

Public Service has contracted for the total output, some 170 tons a day, from a fluid coking unit recently completed at Esso Standard Oil Co.'s refinery in Baltimore, Md. The coke will be burned in modern boilers at the utility's Essex generating station in place of about 750 bbl a day of heavy fuel oil.

Decision to use the new product as a fuel was based on tests conducted by Public Service on 1,000 tons of fluid coke provided from a unit operated by the Carter Oil Co., Billings, Mont. Conventional ball grinding mills, conveyors and boilers were found to work well on the coke.

Fluid coking as a process was developed by Esso scientists to make gasoline and home-heating oil from heavy tar-like substances left over in conventional refining and normally sold for boiler fuel in competition with coal. It has helped refiners to get 10% more gasoline from a barrel of crude oil which brings the total yield of gasoline to 50% or more. The process is called "fluid coking" because it employs the so-called "fluidized solids" technique enabling solids to flow in a stream of air and oil vapors in the same way liquids flow.

In addition to units at Baltimore and Billings, fluid coking has been licensed by Esso to four other companies and is available for licensing by oil refiners anywhere in the free world.

C&O Spending $2,500,000 On Coal Port Expansion

The Chesapeake & Ohio Railway backed its "faith in the future of bituminous coal" with hard cash last month when its president, Walter J. Tuohy, disclosed that the railroad was investing $2,500,000 to expand its coal-dumping facilities at Newport News, Va. Forecasting heavy foreign demands for American coal, Mr. Tuohy said construction would get underway at once and that the facilities would be ready in 12 months. Some 10,000,000 tons of coal

BACKING UP BETTER LIGHT

in every major coal field

National Mine Service Company

WHEAT

ELECTRIC CAP LAMPS

Behind better, brighter Wheat light, automatic Wheat charging and minimum maintenance is a complete service organization — National Mine Service — an integral part of the value of every Wheat Lamp installation. National Mine guarantees continuous *LIGHT* at continuous top efficiency and consistently low operating cost. Send for the facts!

National Mine Service Company

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7 PLANTS TO SERVE YOU ALL-STATE DIVISION, Logan, W. Va. • ASHLAND DIVISION, Ashland, Ky. KY.-VA. DIVISION, Jenkins, Ky. • WHITEMAN DIVISION, Indiana, Pa. • ANTHRACITE DIVISION, Forty Fort, Pa. BEMECO DIVISION, Beckley, W. Va. • WESTERN KY. DIVISION, Madisonville, Ky.

have been shipped from the port this year.

By extending and widening a pier already supporting one loading tower, the C&O planned to add another and increase the railroad's towers from 5 to 6. Besides the tower and pier, the facilities will include a conveyor, and a rail yard designed to accommodate 250 loaded cars and 250 empties. Coal for export will be dumped from incoming cars by an inland rotary dump to feed a conveyor which will shuttle it to the sea end of the pier and a hopper. From the hopper a telescopic chute will load the coal into the hold of a ship.

Railroads Win Plea, ICC Freezes Surcharge

After hearing protests from coal and other interests in all parts of the country, the Interstate Commerce Commission last month granted a plea by the railroads to make permanent a temporary 12% to 15% freight surcharge won in 1952. Simultaneously with the ICC decision appeared reports that the railroads were preparing to wrest another 5% from the nation's shippers. According to one such report, eastern railroads were determined to seek an additional 5% to offset higher wages that had been granted Oct. 1.

The temporary surcharge, worth $1,000,000,000 a year to the railroads, had been scheduled to expire Dec. 31. In winding up its plea for its extension, the railroad industry had said that a cutback would mean "financial death" to some lines. The coal industry, led by the National Coal Association, maintained that the railroads were in the strongest financial position in history and that the coal industry was in serious trouble.

The increase was the fourth granted to railroads since World War II.

Bituminous Coal Output Still Climbing

YEAR TO DATE	PRODUCTION
Oct. 15, 1955	359,775,000 tons
Oct. 16, 1954	298,455,000 tons

1955 output 20.5% ahead of 1954

A month earlier, through Sept. 20, 1955 output was 21.1% above 1954

WEEK ENDING	PRODUCTION
Oct. 15, 1955	9,760,000 tons
Oct. 16, 1954	8,421,000 tons

Anthracite Steady

YEAR TO DATE	PRODUCTION
Oct. 15, 1955	19,210,000
Oct. 16, 1954	20,822,000

1955 output 7.7% under 1954

A month earlier, 1955 output was 8.5% under 1954

WEEK ENDING	PRODUCTION
Oct. 15, 1955	500,000
Oct. 16, 1954	561,000

J. H. EDWARDS (left) gets admiring glance from Mrs. Edwards as he displays plaque citing him for 31 yr service with *Coal Age*. Editor Ivan A. Given (right) presented the plaque at a retirement luncheon in McGraw-Hill's New York headquarters Sept. 29.

J. H. Edwards, Power Specialist, Retires As Coal Age Staff Editor

As an experienced electrical and mechanical engineer J. H. Edwards has been a much-sought-after guide along the mechanization route that coal took three to four decades ago. As an associate editor of *Coal Age* since 1924, he became a writer who has provided a constant flow of accurate, useful material on electrical, mechanical questions, and all other phases of mining as well.

Last month, with plans for spending time with his children and grandchildren, seeing America and generally enjoying a leisurely existence, he retired after 31 yr as a *Coal Age* staffer.

At a retirement luncheon in McGraw-Hill's New York headquarters Sept. 29, Carl J. Coash, his publisher, and Ivan A. Given, his editor, presented him with a mahogany plaque from his old and new associates. Its bronze-relief letters read: "For outstanding contributions to coal-mining progress through sustained and notable contribution to the growth and broadening of the *Coal Age* editorial service."

The list of guests included Mrs. Edwards; Ralph Smith, vice president and editorial director of McGraw-Hill Publishing Co., and R. Dawson Hall, the only surviving member of the staff that got out the first *Coal Age* issue Oct. 14, 1911. Mr. Hall retired in 1946.

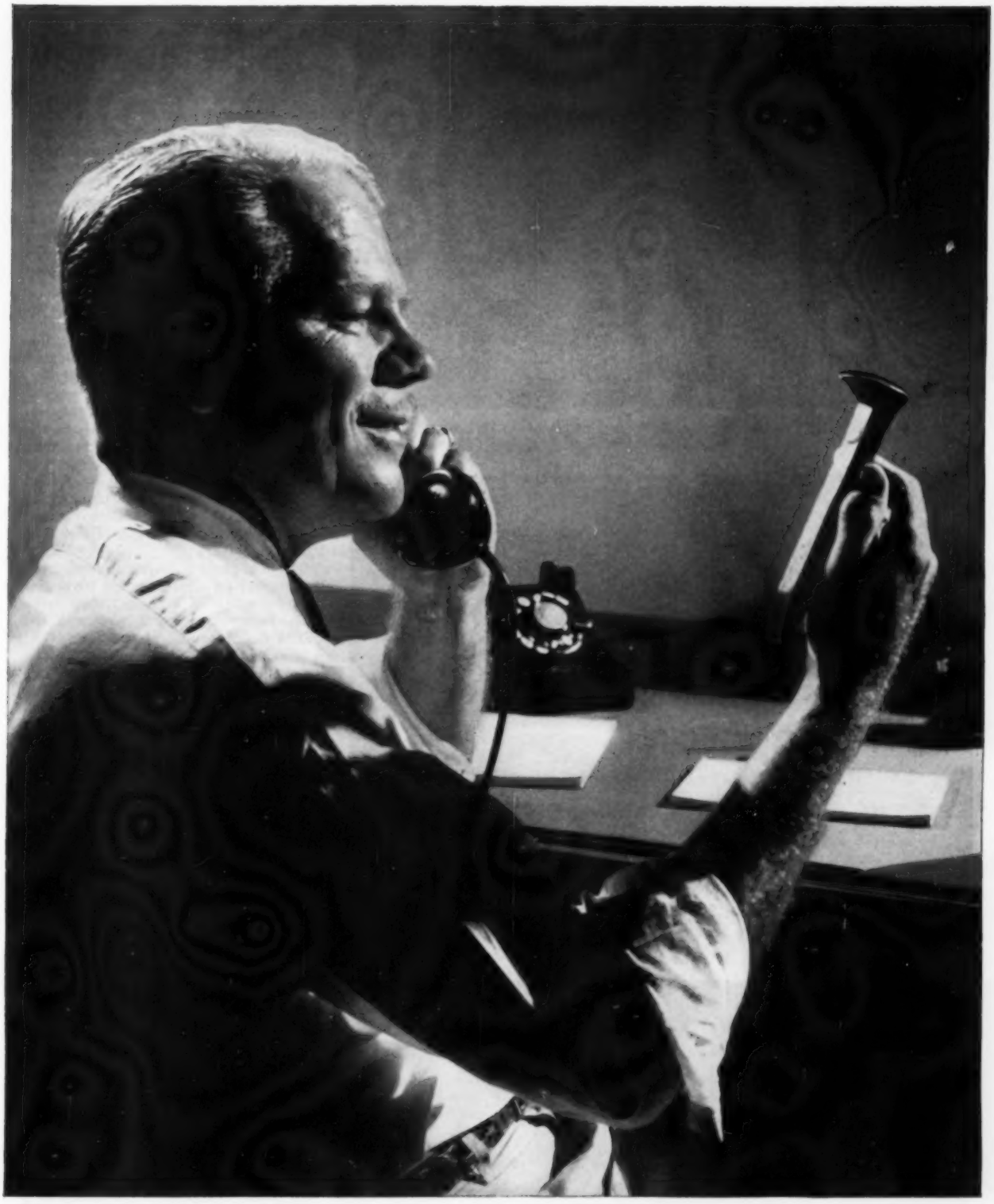
Jack, as he is universally known, wrote his copy at home in Huntington, W. Va., between his many field trips. He visited the New York office rarely and usually originated his material himself. "He came around here maybe once every two years," says Editor Given. "But he was a self-starter and a go-getter, and didn't need to be checking all the time to do a bang-up job."

A graduate of Iowa State University in 1912, Jack began working for the Rock Island railroad car shops in Silvis, Ill., as an electrical engineer's assistant. It was there that his first contact with mining turned up. Frequently he was called on for power repairs in a number of Rock Island mines. In 1917 he was moved to Rock Island's Chicago office and promoted to supervisor of stationary power. A year later, 1918, he accepted an offer from Milwaukee Coke & Gas Co. and the Steel & Tube Co. of America because the pay was better. The offer meant moving to Huntington as chief electrical and mechanical engineer for the Elkhorn Piney Coal Mining Co. In this capacity he supervised power operations in 18 coal mines in southern West Virginia and eastern Kentucky. In 1924 he joined *Coal Age* as a power and electrification specialist.

An active man among coal mining men, Jack organized and became the first president of the West Virginia-Kentucky Institute of Mine, Mechanical and Electrical Engineers in 1921-22. He is a member of the American Institute of Electrical Engineers, American Institute of Mining and Metallurgical Engineers, the West Virginia Coal Mining Institute, the Huntington Engineers' Club and, as an indication of his broad extracurricular interests, the West Virginia and Ohio Archaeology Societies.

Soviets Report Coal Output

Russia disclosed last month that the Soviet 1955 coal output was expected to reach 390,000,000 metric tons, a production level said to be 3.4 times the 1940 output. According to a statement by the Soviet Minister of coal production, 250 new coal fields and coal mines have been discovered or opened since 1951. The new sites are said to contain close to 100 million metric tons.



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FOR FIRST AID

FOR MINE RESCUE.

FIFTY-FIVE first aid and seven mine rescue teams from eight states journeyed to Knoxville, Tenn., last month, lured by the National First Aid and Mine Rescue Contest, Oct. 10 to 12. In the administration building at Knoxville's Chilhowee Park, U. S. Steel's first-aid team from No. 1 mine, Gary, W. Va., turned back 54 other teams in the first-aid contest to capture first place and reap the awards that went with it. The team was captained by Luther Hall.

In the mine-rescue contest, a team from Hendrix mine, Consolidation Coal Co., Jenkins, Ky., representing the Big Sandy-Elkhorn Coal Mining Institute, defeated six competing teams for first place honors. It was captained by Douglas Damron.

Three major awards were presented to each first place team at a dinner in the University of Tennessee's University Center. The Gary first-aid team was awarded a silver cup trophy from *Coal Age*, a trophy from the United Mine Workers' of America and Congressional Medallions from the U. S. Bureau of Mines.

The first-place mine-rescue team from Jenkins was awarded a similar silver cup trophy from *Coal Age*, a trophy from Mine Safety Appliances Co. and the USBM Congressional Medallions.

Second place in first aid was won by the Palmer-mine team from the Frick district of U. S. Steel Corp., Uniontown, Pa. It was captained by J. R. St. Clair and was awarded a National Coal Association trophy

Third place was won by team No. 2, U. S. Steel, Gary, W. Va., captained by Robert Long. It was presented with a trophy from MSA.

In mine rescue second place went to a team from Price Mine No. 1, Inland Steel Co., Wheelwright, Ky. Winner of a United Mine Workers' of America trophy, the team was captained by J. P. Gibson and represented the Big Sandy-Elkhorn Coal Mining Institute. Third in mine

U. S. BUREAU MEN, STATE MINE INSPECTORS and others who judged or took part in the arrangements and management of the contest.

WIN NCA TROPHY—Harry Gandy Jr., director, Dept. of Safety, National Coal Association, presents NCA trophy to the second-place team in the first-aid, U. S. Steel, Frick Dist., Palmer mine, Uniontown, Pa. J. R. St. Clair captained the squad to victory during three day meet at Knoxville.

AWARDED UMWA TROPHY—Percy Tetlow, assistant to the president, UMWA, awards trophy to second-place mine-rescue team, Inland Steel Co., No. 1 mine, Price, Ky. The team was captained by J. P. Gibson and represented the Big Sandy-Elkhorn Coal-Mining Institute.

Winners Feted

rescue was won by a team from Mine No. 2, Wisconsin Steel coal mines, International Harvester Co., Benham, Ky. It was awarded a trophy from NCA.

In the combination class, competing both in first-aid and mine-rescue events, team No. 2, Glenn Castle No. 6 mine, Hanna Coal Co., Div. of Pittsburgh Consolidation Coal Co., Adena, Ohio, was first; Green Valley Mine, Snow Hill Coal Corp., Terre Haute, Ind., second.

By prior agreement, the national contest also decided the first-aid championship of three states as follows: Kentucky, Blue Diamond No. 1 mine, Blue Diamond Coal Co., Blue Diamond; Tennessee, Boyd, Eureka, and Burra Mines, Tennessee Copper Co., Copperhill; Virginia, Derby Colliery, Stonega Coke & Coal Co., Big Stone Gap.

Contest winners were chosen on the basis of the speed and proficiency with which they worked difficult problems. Each first-aid team worked at least 10 problems in the two-day meet, while mine-rescue crews were judged on a series of maneuvers following a simulated mine disaster.

H. R. Burdlesky, safety representative, USBM, Pittsburgh, was chief judge of the first-aid contest, and W. R. Park, district supervisor, USBM, Mt. Hope, W. Va., chief judge of the mine rescue contest.

Howard T. Batman, general manager and counsel, Lynch Coal Operators' Reciprocal Association, Terre Haute, Ind., was master of ceremonies at the dinner.

The contest was held by the U. S. Bureau of Mines and The Joseph A. Holmes Safety Association in cooperation with the NCA, the UMWA, the state Department of Mines, Lynch Coal Operators' Reciprocal Association, and the Knoxville Chamber of Commerce.

J. J. Forbes directed the contest and was assisted by W. Dan Walker Jr., district supervisor, USBM, Pittsburgh, Pa.

(*Continued on p 146*)

FIRST IN FIRST AID—Percy Tetlow, assistant to the president, United Mine Workers of America, presents UMWA trophy to the top team in the first aid, U. S. Steel team No. 1, Gary Dist., West Virginia

FIRST IN MINE RESCUE—J. J. Forbes, director, U. S. Bureau of Mines, presents Congressional Medallions and Coal Age cup to the top team in the mine rescue, Hendrix mine, Consolidation Coal Co.

AWARDED MSA TROPHY—Everett White, assistant manager, Mine Dept., Mine Safety Appliances Co., awards MSA third-place trophy in first aid competition to United States Steel team No. 2, Gary W. Va. The team was captained by Robert Long during three day safety tourney at Knoxville's Chilhowee Park. Award was made at ceremonies in Univ. of Tennessee.

AWARDED NCA TROPHY—Harry Gandy Jr., director, Department of Safety, NCA, presents trophy for third place in mine rescue, Wisconsin Steel coal mines, No. 2 mine, Benham, Ky.

Fix Bituminous Miners' Minimum Wage

The pay rates for miners producing bituminous coal for the government were fixed at minimums from $1.40 to $2.34 last month by Secretary of Labor James Mitchell. In an order that becomes effective Nov. 25, the miners' pay was set at levels requested by major coal producers employing union labor and by the United Mine Workers of America.

The order was expected to directly affect non-union coal operators that pay less than UMWA wage scales. In protesting the order the non-union operators had argued that many of them would be forced out of business.

Secretary Mitchell acted under the provisions of the Walsh-Healy Act, which authorizes the Labor Department to set minimum wages for workers engaged in filling government contracts. His action sets miners' pay at $1.40 an hour in Iowa, the lowest rate, and $2.34 in Montana, the highest.

In the bulk of the Appalachian region, which includes Pennsylvania, Maryland, W. Virginia, Virginia, Ohio, Illinois, northern Tennessee and eastern Kentucky, a rate of $2.245 an hr was fixed. Non-union miners are reportedly paid approximately $1.25 an hr.

The government bought some 13,000,000 tons of coal last year; most of it was bought by the Tennessee Valley Authority. The TVA policy of buying coal at the cheapest price and wherever it was available, prompted the UMWA and the coal industry to petition Secretary Mitchell for the wage order. The most vigorous protesters of a minimum wage were non-union operators from Virginia, Kentucky, Tennessee and central Pennsylvania.

Meanwhile, the TVA has disclosed that the government's action would not have any effect on the TVA's coal supply. George Claytor, TVA's coal procurement officer, said the authority would "continue to buy coal on a competitive basis no matter where it comes from." He said the new order "will merely mean that anybody who sells TVA coal after the order is effective will be required to pay miners those minimum wages, provided the contract is $10,000 or more."

Mr. Claytor also confirmed the statement by Secretary Mitchell that TVA purchases were expected "to increase substantially in the near future." Purchases for the current fiscal year, which will end next June, will reach "nearly 17,000,000 tons," he predicted.

Coal Age Hires Staffer To Write, Edit News

Christopher Elias, a New York State newsman, has joined the staff of *Coal Age* as an assistant editor. He will write and edit the Equipment News and News Roundup sections of *Coal Age* and assist in production. A graduate of Hartwick College, Oneonta, N. Y., Mr. Elias was graduated with an M. S. degree from Columbia University's Graduate School of Journalism. Before joining *Coal Age*, he had been bureau reporter then sports editor of the Oneonta Star, Oneonta, N. Y. He has also worked as a news copy editor for the Binghamton Press, Binghamton, N. Y.

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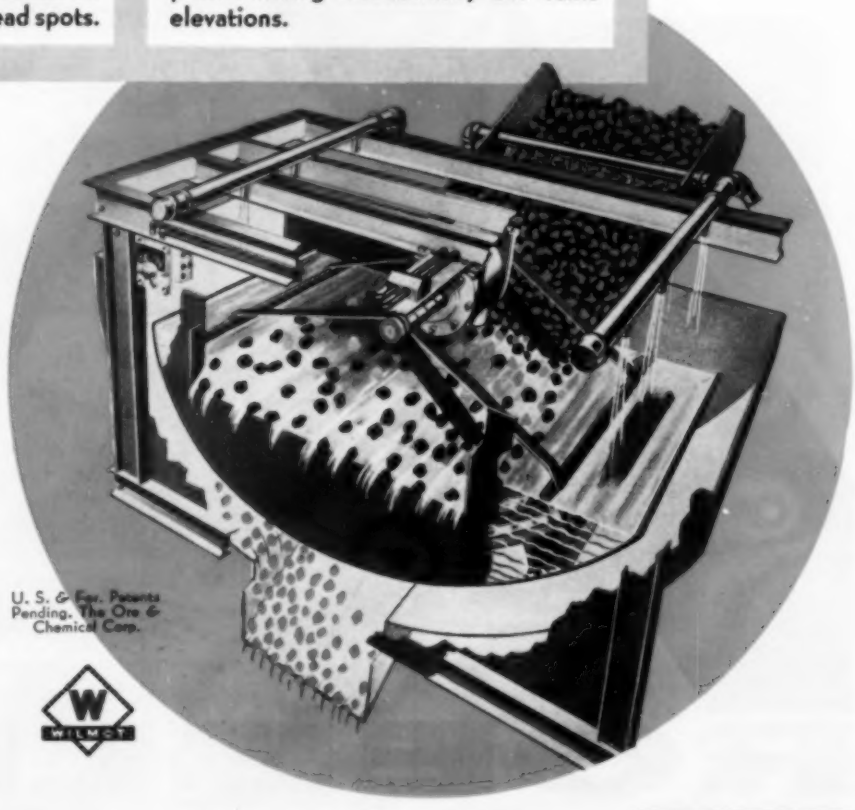

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Begin Coal Pipe Line Construction In Ohio

Pittsburgh Consolidation Coal Co.'s plan to pipe coal 106 mi from Georgetown to Cleveland, Ohio, moved closer to reality last month when a construction company began laying the first section of pipe at Georgetown. When the pipeline is completed next year, pulverized coal will be mixed with water and pumped to Cleveland where the coal will be separated and delivered to Cleveland's Electric Illuminating Co.

Gulf Smokeless Buys W. Virginia Coal Firms

Two West Virginia coal companies, the MacAlpin Coal Co. and Winding Gulf Collieries Co., have been bought by the Gulf Smokeless Coal Co., Tams, W. Va., reportedly for several million dollars. W. P. Tams Jr., president of Gulf Smokeless, said that the purchase boosted the company's coal holdings to 40 or 50 million tons and represents a daily production of more than 5,000 tons.

Winding Gulf, with headquarters in Bluefield, W. Va., operated mines at East Gulf, Herndon and Goodwill, W. Va.

In the MacAlpin transaction, all the physical assets of the company were bought. Adjacent to Gulf Smokeless, the property will be known as the MacAlpir mine of Gulf Smokeless.

Preparation Facilities

Kanawha Mfg. Co., Imperial Smokeless Coal Co., Tipple, Quinwood, W. Va.—Contract closed with Jeffrey Mfg. Co., Industrial Div., for 7 ft, 8-cell Jeffrey Baum jig, 450 tph, to handle 8x0 coal.

High Splint Coal Co., High Splint, Ky.—Contract closed with Jeffrey Mfg. Co., Industrial Div., for 7 ft, 8-cell Jeffrey Baum jig, 400 tph, to handle 8x0 coal.

Old Ben Coal Corp., No. 9 mine, West Frankfort, Ill.—Contract closed with McNally Pittsburg Mfg. Corp. for 165 tph coarse coal McNally Tromp heavy medium cleaning addition, including McNally Tromp coarse coal bath for 7x3½ raw coal.

Carbon Fuel Co., Charlestown, W. Va.—Contract closed with McNally Pittsburg Mfg. Corp. for McNally Tromp dense media and fine coal table cleaning addition at Winifredo, W. Va., facilities.

Eastern Coal Corp., Stone, Ky.—Contract closed with McNally Pittsburg Mfg. Corp. for McNally Rheo fine coal cleaning addition to facilities at McAndrews, Ky., including Rheo launders, three McNally Dryclone centrifugal dryers and water handling circuit.

Bluebird Coal Co., Carrier Mills, Ill.—Contract closed with Deister Concentrator Co. for six SuperDuty Diagonal-Deck No. 7 coal washing tables to handle ⅜x0 coal.

News Briefs and Trends

Pickets Halt Coal Train At Alabama TVA Plant

Pickets believed to be from Chattanooga's strikebound coal fields turned up in Bridgeport, Ala., last month to head off a 17-car trainload of much needed west Kentucky coal that had been destined for the Tennessee Valley Authority's Widows Creek steam plant. The Nashville, Chattanooga & St. Louis Railway train crew, refusing to cross a picket line, had halted its train on the edge of the TVA rail yard.

With its supply of coal from southeast Tennessee cut off since Labor Day by a wage dispute, TVA officials had turned to western Kentucky for supplies but picket lines had succeeded in stopping the train and earlier, had turned back 10 barges laden with 15,000 tons.

A week later despite the expectation of a settlement, 3,000 miners armed with rifles and shotguns nearly clashed with sheriff's deputies in Tennessee's Hamilton County. Reportedly some "38 or 60 carloads of them threatened violence on non-union miners and operators."

The expectation of a settlement came after 200 small mine operators had accepted a 20c a ton price increase from two larger operators whom they supply. With the price acceptance, the larger coal producers reported they planned to "produce coal" for the first time in six weeks. But another delay turned up when 400 coal-hauling truckers balked, demanding half the 20c increase granted the independent miner operators. They were offered an additional 2c for each ton of coal they hauled.

Meanwhile, TVA continued to buy its coal from west Kentucky fields.

Miners struck the Chattanooga fields, a chief coal source, Sept. 8, after independent operators had failed to boost pay in line with a recent $1.20 raise won by the United Mine Workers of America. Two major operators, Tennessee Products & Chemical Corp. and Tennessee Consolidated Coal had granted the increase in their mechanized mines. But independents, leasing from and selling to the major two producers, said they could not grant the raise unless they, themselves, were granted a 40-cent a ton increase by the big two.

Coal, Rails, Labor Fight Gas Export, Import Plans

Five organizations representing the coal industry, railroads and labor have joined forces to fight natural-gas export and import proposals made by the Tennessee Gas Transmission Co. and a newly-formed affiliate, the Midwestern Gas Transmission Co. The proposals, filed with the Federal Power Commission last month, would permit natural gas importation from Canada for distribution in Minnesota, Wisconsin, Michigan and North Dakota. They would also permit American gas to be exported at Niagara Falls, N. Y., to develop markets in eastern Canada while a Canadian pipeline is constructed from Alberta to Toronto. Opposing the plan are the National Coal Association, the Anthracite Institute, Fuels Research Council, Inc., American Coal Sales Association and the Brotherhood of Railroad Trainmen. Tom Pickett, NCA vice president, called the plan "an attempt to have Americans subsidize the building of the all-Canadian natural-gas pipeline."

AGE To Spend $28,000,000 For Ohio Electric Unit

Plans to construct a 225,000-kw steam-electric generating unit at the Muskingum River plant, Ohio, were disclosed Oct. 19 by Philip Sporn, president of the American Gas & Electric Company. The project will cost an estimated $28,000,000 and is scheduled for completion in June, 1957.

The new unit, capable of supplying electric service to 650,000 average homes, will make the Muskingum station one of the two largest power plants in Ohio, second only to the Kyger Creek plant of Ohio Valley Electric Corp. Coal requirements of the new unit are expected to be 575,000 tons a year, raising the entire plant's total burn to an anticipated 2,275,000 tons.

NCA Committee To Study Coal Car Shortage

A special committee formed to study coal car shortages was appointed by the National Coal Association's president, L. C. Campbell, last month. It was expected to hold an early meeting. The committee is headed by Joseph T. Berta, president of Pittston Clinchfield Coal Sales Corp., New York, N. Y. Other members are J. D. Francis, president, Powelton Coal Co., Huntington, W. Va.; R. L. Ireland, chairman executive committee, Pittsburgh Consolidation Coal Co., Cleveland; R. H. Knode, chairman, Stonega Coke and Coal Co., Philadelphia.

Harry LaViers, president, South-East Coal Co., Paintsville, Ky.; A. R. Matthews, president, Pocahontas Fuel Co., Inc,. Pocahontas, Va.; James W. Morgan, president, Syrshire Collieries Corp., Indianapolis; C. J. Potter, president, Rochester & Pittsburgh Coal Co., Indiana, Pa.; Henry C. Woods, vice president, Sahara Coal Co., Chicago.

West Virginia Mine Struck 80 Walk Off; 70 Stay On

Production continued last month at the Banner Fuel Coal Corp. mine in Cranes Nest, W. Va., despite a strike by some 80 miners, more than half the entire labor force. About 70 miners stayed on the job as orderly picketing began on the mine entrance road. Owned by E. P. Litton, Bristol, W. Va., and Scott Litton, Bluefield, W. Va., the mine was one of the area's largest coal producers during World War II. Unionized, it was closed in 1954 because its owners said they could not pay union wages. Re-opened later in the year without union affiliation, it employed 50 men. Its labor force had tripled to some 150 employees by last month.

UMWA Reinstates Miner

A Uniontown, Pa., miner, George H. Livengood, has been reinstated in the United Mine Workers of America after being expelled in 1949. Mr. Livengood had filed suit in Federal court in Washington, demanding an accounting of the UMWA's retirement and welfare fund. He said after his reinstatement last month that he would not withdraw his suit for damages against the union.

Order Five Coal Companies To Pay $107,658 Royalties

Federal Judge Cale J. Holder has ordered five Indiana coal companies to pay $107,658 in royalty payments to the United Mine Workers welfare fund. In handing down the ruling, Judge Holder also ordered that the companies pay 6% interest and court costs. The suits were brought by the UMWA which sought to recover the royalties agreed on in labor contracts between the companies and the UMWA. The contract agreements specified that employers pay the union 40 cents on each ton of coal produced. The Indiana coal companies were: Quality Mining Co., Three Coal Co.'s, Shaw Mining Co., all Boonville. Landrey Mining Co. Inc., Winslow and Rose Hill Mining Co., Inc., Newburgh.

Heart Attack Beds Lewis Attack 'Slight:' Doctor

John L. Lewis, head of the United Mine Workers of America, suffered a "slight" heart attack in September. The 75-year-old labor leader had entered Emergency Hospital in Washington Sept. 23 for a rest and checkup. In October his physician, Dr. John Minor, disclosed that a case of coronary thrombosis, similar to that which had struck President Eisenhower "but not nearly to the same degree," had disabled the UMWA leader.

Coal Buying Flip-Flop May Be Political Issue

The government's failure to make good on a promise to buy 10,000,000 tons of coal from distress areas in the United States under the foreign aid program loomed as a political issue last month. The resentment of Congressmen in the affected coal areas raised a new threat to the administration's program of aid. Democrats charged a "double cross," while Republicans from the affected areas vigorously protested the administration's move. In Washington Sen. Joseph C. O'Mahoney, D-Wyo., chairman of the Senate Interior subcommittee on fuels, announced that an investigation into the emergency coal purchasing plan would

get underway. He assigned two members of his staff to get "the whole story."

The government's plan to buy coal from distress areas turned up in 1954 when Harold E. Stassen, foreign aid chief, said his agency would begin a $150,000,000 emergency program to buy 10,000,000 tons of coal. But last September John B. Hollister, head of the International Cooperation Administration which has replaced Mr. Stassen's agency, revealed in a letter to Representative Robert H. Mollohan, D-W. Va., that the plan had been abandoned. Some 1,130,000 tons of coal had been purchased at its termination. Subsequently, Rep. Daniel J. Flood, D-Pa., a member of the House Foreign Aid Appropriations subcommittee, told Mr. Hollister that the foreign aid program was in for trouble on appropriations.

Breaker Strike Flares; Dies As Pact Is Signed

A strike flared, then died in two days last month, after the operators of a new anthracite breaker in Suffolk, Pa., agreed to pay the United Mine Workers Health and Welfare fund a 50-cent royalty on every ton of coal produced. The operators, Blaschak Bros., at first had defied some 600 picketing UMWA men and declared it had closed a contract with the Independent Miners, Breakermen and Truckers Assn. of Schuylkill County. John Blaschak, one of the owners, said the company would petition the National Labor Relations Board for an election. The UMWA had countered with the declaration that it would not participate in an election if the NLRB should order one. Mass picketing began and the miners blocked the breaker's main entrance. In two days an agreement was signed and Blaschak Bros.' ten employees had become members of the UMWA.

Colorado Coal Properties Bought By U. S. Steel

United States Steel Corp. has exercised an option to purchase two coking coal properties of Minerals Development Corp., in western Colorado. Claude P. Heiner, Salt Lake City, Utah, president of Minerals Development, said the price was "very substantial." The properties are estimated to contain between 25 and 50 million tons of recoverable coal for the Columbia Works, Geneva, Utah. Coking coals are rare in the western United States. These were discovered only after close analysis of beds of the Somerset and Oliver mines. The Somerset properties, some 5,300 acres, have been producing bituminous on a commercial basis for more than 30 yr. L. J. Westhaver, San Francisco, operating vice president of Columbia-Geneva Steel Div., said the purchase was made to assure U. S. Steel a continued future reserve.

NCA Lauds College Program Training Leaders In Coal

Students enrolled at the Michigan College of Mining & Technology, Houghton, Mich., are being well trained for employment in the mining industry, the National Coal Association's Training and Education Committee concluded last month after a guided tour of the campus. Coal, the committee added in its conclusion, "is missing a great opportunity to get future leaders if it fails to employ its proper share of those who are available." The conclusions came after the committee had heard discussions of curricula by Michigan College department heads and had participated in question and answer periods between themselves and the faculty. Representing the NCA were H. C. Woods, chairman of the committee and of the Sahara Coal Co.; G. E. Enos, executive vice president of the Enos Coal Mining Co.; H. C. Walter, personnel manager, Lorado Coal Mining Co.; and C. R. Nailler, president, Christopher Coal Co.

Aid, Rescue Teams Divide Honors At Pikeville Meet

Inland Steel's mine-rescue team from Price, Ky., won first place at the Big Sandy-Elkhorn Coal Mining Institute contest Oct. 8 in Pikeville, Ky. Consolidation Coal's team from the Hendrix mine, Deane, Ky., was second, and Inland Steel's team from Wheelwright, Ky., placed third.

In first-aid events Turner Elkhorn Mining Co., Drift, Ky., was first in the adult white class; Inland Steel's mine at Price, Ky., was second, and Consolidation Coal's first-aid team from McRoberts, Ky., placed third.

In the adult colored first-aid event

Consolidation Coal's mine at McRoberts, Ky., was first; its mine team from Jenkins, Ky., second. Inland Steel's Wheelwright mine was third.

J. H. Mosgrove, secretary of the mining institute, said that the top teams were expected to compete in the 17th National First Aid and Mine Rescue Contest in Knoxville.

Spark Fires Illinois Mine

An early morning fire believed touched off by an electric spark from a snapped electric cable broke out in the Freeman Coal Co.'s No. 3 Orient mine near Waltonville, Ill., Oct. 11. No injuries were reported.

Remodel, Operate Breaker

Remodeled at a cost of some $58,000 a breaker owned by Dial Rock Preparation Co., formerly Dial Rock Coal Co., Exeter, Pa., began operations last month. The breaker will process some 700 tons of run of mine coal produced by the Alco Mining Co., Wilkes-Barre, Pa., according to Aloysius J. McNulty, president of Dial Rock.

76-Oven Coke Battery Operating In Youngstown

A new 76-oven coke battery has begun operating at the Campbell Works, Youngstown Sheet and Tube Co., Youngstown, Ohio. Its daily capacity is 1,250 tons of coke, or some 450,000 tons a year. The new ovens feature underjet firing and have a 730 cu ft capacity. They are more than 43 ft long, 13 ft high and average 18 in wide with a 3 in taper. The entire battery is more than 350 ft long.

Low Grade Coal Processing Planned For Wyoming Mine

Koal-Krudes Inc., Spokane, Wash., has been organized to recover coal char and creosote from low grade coal, using a process owned by the PDP Co., Lewiston, Idaho. Elmo Wilcox, president of Koal-Krudes, said the firm plans a $200,000 plant at Monarch, Wyo., to process 250 tons of coal daily. The firm has contracted for a site near the mine of the Big Horn Coal Co., Sheridan, Wyo. Coal char, a high intensity, smokeless and odorless fuel, is used in heavy industry such as smelters. Creosote is used extensively in the wood-processing industry.

Tragedy Site Leased

The site of a breaker collapse that killed four men and injured 10 others near Shenandoah, Pa., Aug. 22, has been leased for an open pit mining operation by the Capparell Stripping & Construction Co., Hazleton, Pa. The site is owned by the Turkey Run Fuels Co. It leased the ground after the Kohinoor Coal Co., owner of the collapsed colliery, had surrendered its lease. Capparell spokesmen said the company will not construct a breaker, but will take its coal elsewhere for processing.

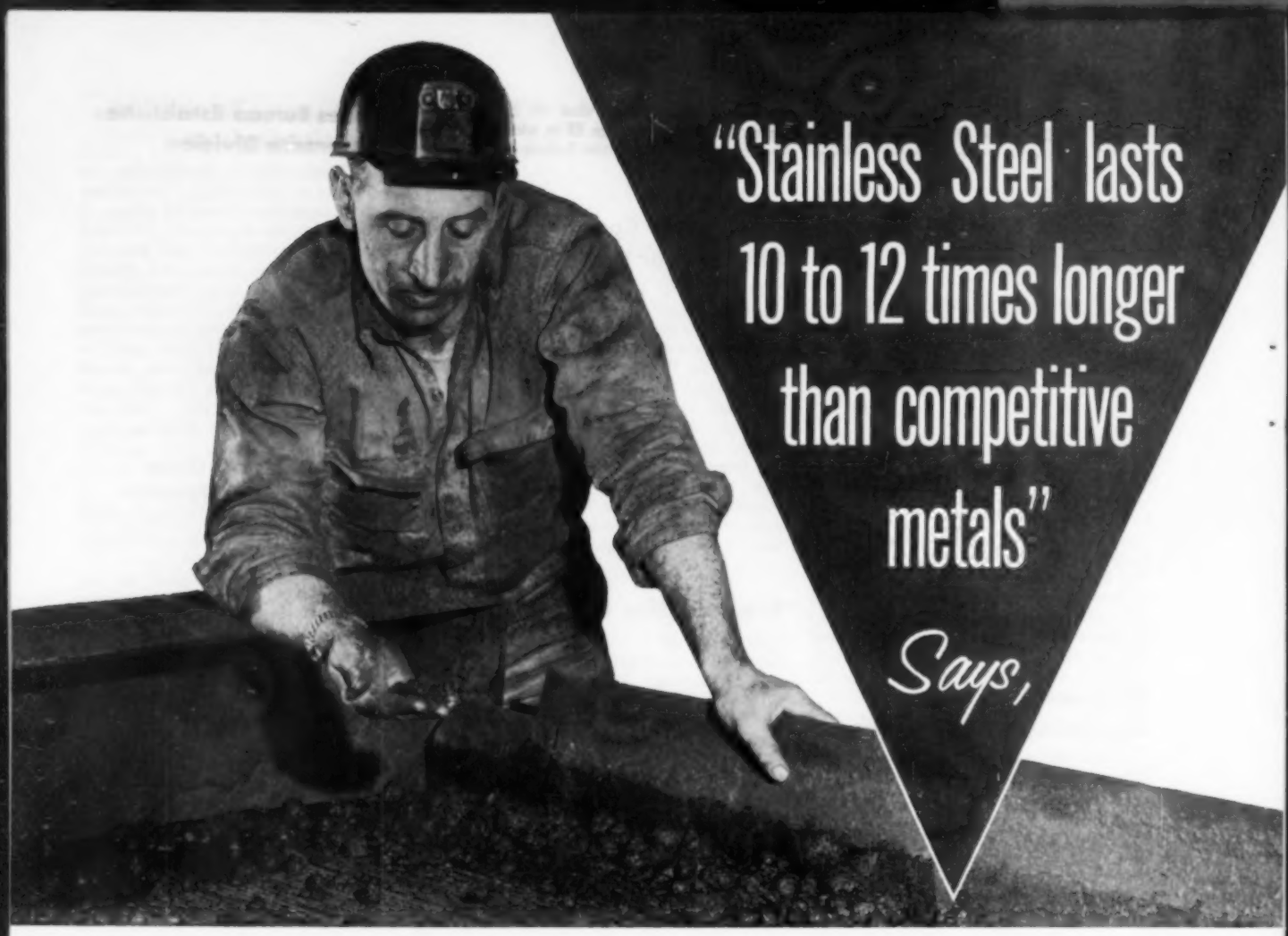
Mines Bureau Establishes Anthracite Division

The Department of Interior has announced the establishment of an anthracite division in the Bureau of Mines. It was organized, the department disclosed, to direct the government's part in a $17 million cooperative state and federal mine-drainage program in Pennsylvania's anthracite region. "It will also guide intensified research aimed at increasing productivity and use of hard coal," a department announcement said. Joseph A. Corgan, head of the bureau's work in hard coal and coke since 1945, has been named chief of the division.

High Court Upholds Claim Against Strip Mine Operator

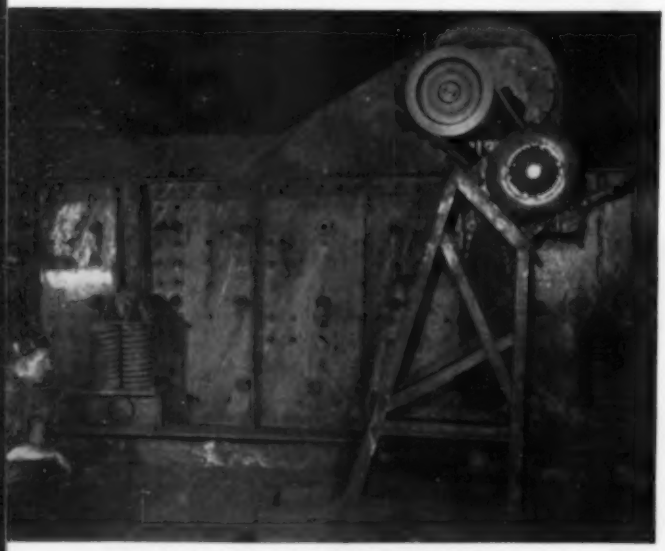
A Court of Appeals in Kentucky last month upheld an Appellate Court decision that a mining operator, under certain conditions, can be made to pay damage for destroying land surface and timber in stripping coal. The court held that I. H. Buchanan could remove coal from a Kentucky tract under rights granted in a 1903 deed, but declared that the use of the surface and the destruction of it are two different things. The 1903 deed "neither included or excluded" strip mining, Commissioner Watson Clay wrote, upholding an earlier Appellate Court opinion that the operator could remove coal by strip mining, but that it was an invasion of the rights of the owners, Raleigh and Stella Watson.

(*Continued on p 150*)



"Stainless Steel lasts 10 to 12 times longer than competitive metals" Says,

This dewatering sludge screen shakes at 1200 spm (strokes per minute) to remove wash water from coal. Screen will last about 14 months.



Inside this Simplicity shaker unit, Stainless Steel screens and dead pans are constantly sizing and moving clean coal.

Mr. V. D. Pickelsimer, Vice President-Operations
South-East Coal Company, Seco, Kentucky

The South-East Coal Company produces about 700,000 tons of coal a year—a low ash, low sulphur premium stoker coal. Everywhere you look, in and around the mine, you'll find lots of Stainless Steel.

According to Mr. Picklesimer, "Stainless Steel is the best thing we can use for the dewatering screens. Nothing else is tough enough to resist the abrasion and still have good corrosion resistance, an absolute must because of the high acidity of our mine water. We average 14 months of service from our Stainless screens—equivalent to 200,000 tons of coal.

"Stainless Steel is the best metal we can use for all purposes where metal must come in contact with abrasion and acid conditions. It even works for us when we shut down the tipple periodically, because there is no clean-up time lost because of rust formation."

Be sure of high quality when you buy new equipment. Specify service-tested USS Stainless Steel.

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UNITED STATES STEEL

Automation Creates Jobs For Workers With Skills

There is new and reassuring information for those who fear that "automation" — the control of machines by machines — will mean fewer job opportunities. It comes from a special survey of 1,574 companies in metalworking industries recently completed by AMERICAN MACHINIST, a McGraw-Hill publication. More than one-fifth of the companies reported that they already have automatic loading, transfer or assembly machinery in operation. In these companies as a whole there has been a net increase in total employment since this machinery was installed.

According to the AMERICAN MACHINIST survey, of these companies with actual experience in automation

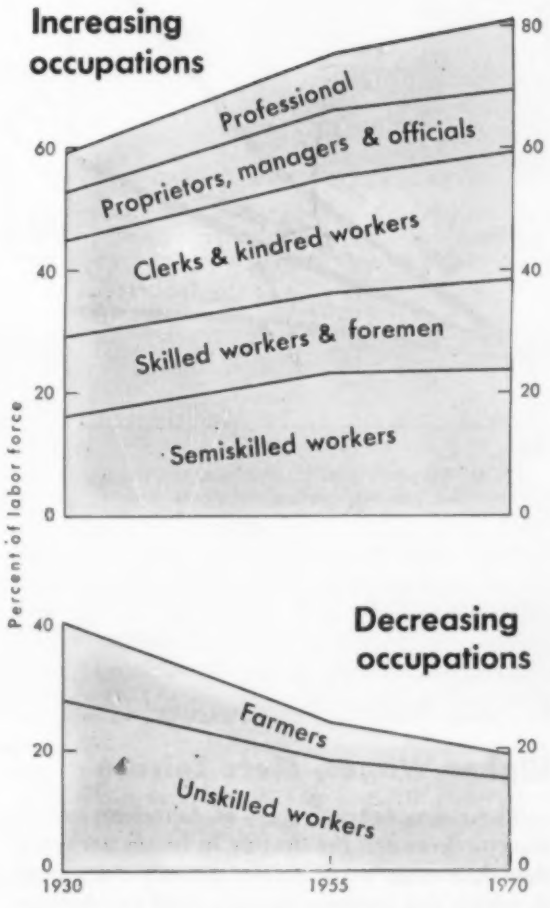
- 26% reported increases in employment averaging 21%
- 51% reported no change in total employment
- 23% reported decreases in employment averaging 16%

More Jobs for the Skilled

Of greater significance, however, is the response by 40% of these companies that they required more skilled maintenance men and by 21% of the companies that they had increased their engineering staffs. This indicates that automation is strengthening a trend already evident in the United States, a trend of expanding opportunity for those with industrial and professional skills and, relatively, of contracting opportunity for the unskilled.

The following chart shows how strong this trend has been over the past 25 years and how strong it may be expected to be over the next 15 years.

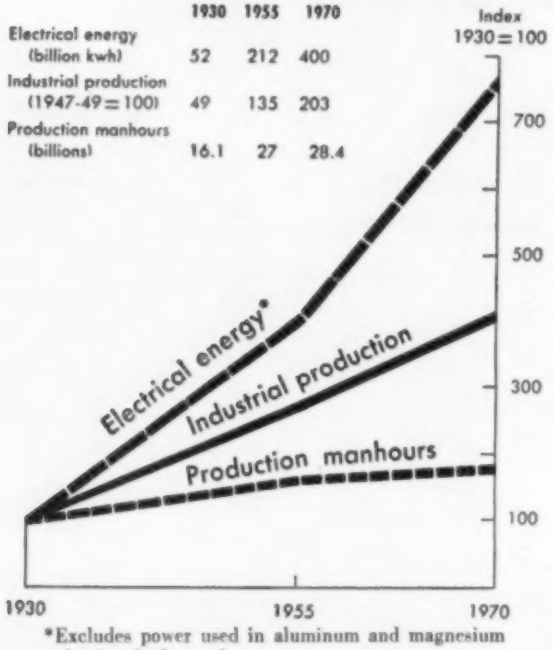
There has been a sharp decline in the percentage of unskilled workers in the nation's labor force and a corresponding increase in the percentage of those with varying degrees of skill.



It is possible, of course, to cite cases of individuals and groups that do not conform to the charted trends. Farmers, for example, are becoming at the same time more skilled and less numerous. But this does not upset the broad proposition that opportunities are increasing for those who have skills.

Power and Production

Much of the basic explanation for the relative expansion of opportunities for those with industrial and professional skills lies in the increasing use of power-driven machinery. This has made possible a vastly greater increase in manufacturing production than in the manhours of human labor devoted to it. The following chart shows the relative increases in electrical energy and manhours of labor used in manufacturing since 1930 and the rise in industrial production.

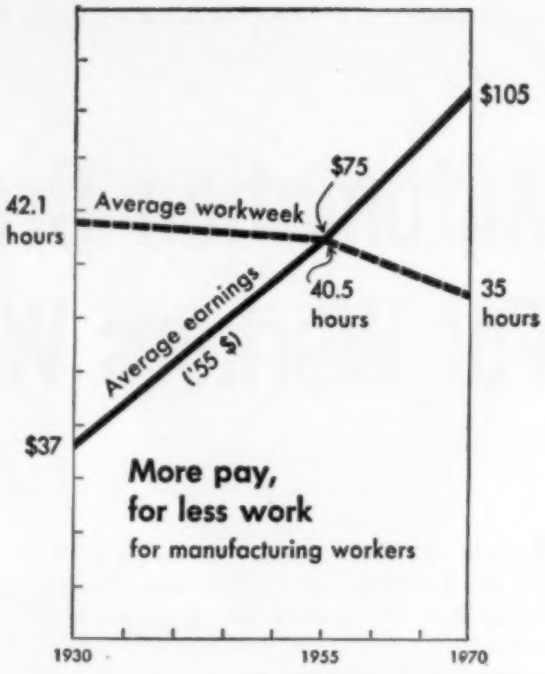


*Excludes power used in aluminum and magnesium reduction, both very heavy power users.

Power-driven machines have reduced the amount of human energy required for physical labor, but they have increased the need for skillful handling and maintenance. As the AMERICAN MACHINIST survey demonstrates, the same is true of automatically controlled machinery.

Higher Wages, More Leisure

The rising average wage of American industrial workers and the decline in hours per week that they must work reflect directly the extent to which the increase in industrial production has outstripped the manhours devoted to it. The final chart shows the increase in weekly wages (in dollars of constant purchasing power) and the decrease in the average workweek in manufacturing since 1930. It also shows the changes that may come in the next 15 years if present trends continue.



There are some who would slow what an earlier editorial in this series characterized as "the continuing process of taking dull and laborious work off the backs and minds of men and transferring it to machines operating in large batteries under automatic control." In doing so, they might make the world safer for those with no skill. The far more constructive course is to welcome the expanding opportunities now being provided and be sure that the nation's young people, who are now starting another school year, are prepared to take advantage of them.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

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Donald C. McGraw

PRESIDENT

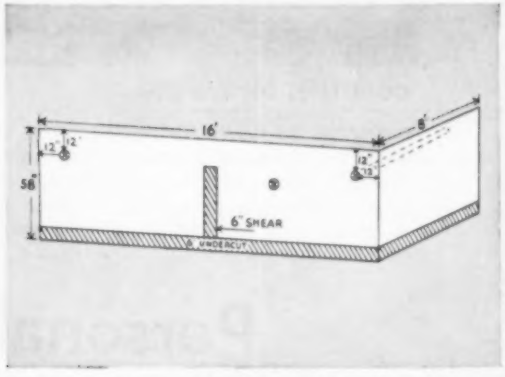
McGRAW-HILL PUBLISHING COMPANY, INC.

"'Monobel'® C gives us consistently satisfactory performance"

reports Grover L. Asbury, Superintendent, Pocahontas Fuel Co., Itman, W. Va.

"Consistently satisfactory performance is one of the keys to successful operation of a modern high-production coal mine. An important part of satisfactory performance is the maximum production of good-sized lump, which reduces our loading and cleaning expense. We consider Du Pont 'Monobel' C a product that is giving us such performance in our mine."

OPERATOR tamps charge of "Monobel" C into hole drilled in face. Three 8′ holes in 58″ high Pocahontas seam are loaded for each shot.



MINE OFFICIALS and Du Pont technical service men cooperated to develop loading pattern (diagram). Application of pattern is shown in photograph of a typical room at the Pocahontas mine: 16′ wide face is undercut 8′, center sheared and loaded with Du Pont "Monobel" C, 1¼″ x 7″.

HEAVING ACTION of Du Pont "Monobel" C breaks and throws large, easy-to-handle lumps of coal away from the face. Loading is quickly and efficiently accomplished, and the room is soon ready to be prepared for another shot.

SHOT has sheared rib clean and left no overhang, reducing time needed for preparation of next shot. With fines minimized, cleaning operations are rapid. Your production schedule will be speeded up, too, if your permissible is Du Pont "Monobel" C.

Every mine owner wants a permissible with a high batting average when it comes to bringing in top percentages of coarse coal. That's why "Monobel" C is so popular in the field. It scores every time—firm lump, low ash. Give it a tryout in your mine. For complete information, contact the Du Pont representative in your district, or write: E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

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Blasting Supplies and Accessories

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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

COAL MEN ON THE JOB

RED JACKET COAL CORP., Wyoming, W. Va.—First shift group: Seated: Roy Short (left) general mine foreman, Vencil Travis, section foreman, Ward Cook, section foreman and Willard Graham, section foreman. Standing: Tom Sizemore (left) maintenance foreman, Clarence Brewer, section foreman and Donald Webb, belt and ventilation foreman.

Personal Notes

Nelson General Manager Of U. S. Steel Coal Div.

ELWOOD B. NELSON has been appointed general manager of the Coal Mining Div. of United States Steel Corp., James C. Gray, vice president in charge of coal operations has announced. Mr. Nelson, chief engineer of raw materials in U.S. Steel's Tennessee Coal & Iron Div., assumes the new post Oct. 1. A veteran of 26 yr service in the TCI division, Mr. Nelson served as coal-washer engineer, washer superintendent, mine superintendent, assistant general superintendent and general superintendent of the division's coal mines. On Oct. 10, 1954, he became chief engineer for raw materials. He is a member of the American Institute of Mining & Metallurgical Engineers, Birmingham Engineers' Club and the Coal Mining Institute of America.

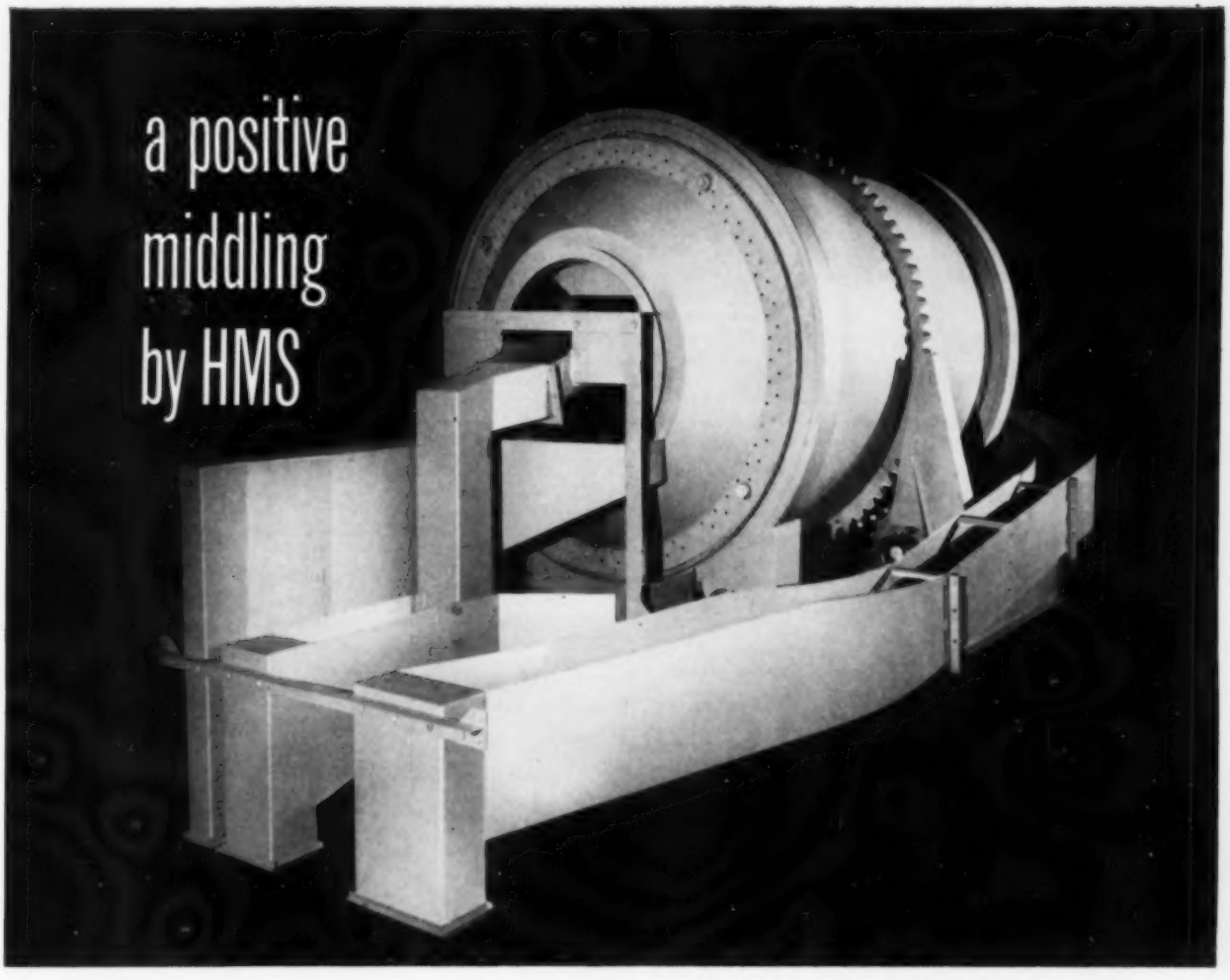
Camicia Is Correct

A caption in the "Island Creek Merger" story in the October issue of *Coal Age*, p 120, inadvertently misspelled the name of the new general manager of the merged properties. **N. T. Camicia** is the way it should have appeared.

C. W. Connor Jr., assistant general superintendent of the Gary district in U. S. Steel's Coal Div., has been appointed district superintendent. At the same time, **Lloyd M. Lineberry**, Mr. Connor's predecessor, has been advanced to assistant to the general superintendent of the Gary-Lynch district.

Mr. Connor joined U. S. Steel in 1942 as supervisor of mechanization for the Frick dist. mines in Uniontown, Pa. Two years later he was promoted to assistant superintendent of Leisenring Mines Nos. 1, 2 and 3. In 1946 he was advanced to superintendent of the Shoaf and Collier mines and in 1948 he moved up to superintendent of the three Leisenring mines. Another promotion in 1953 made him assistant general superintendent of the Frick dist. A year later he was transferred to the Coal Division's Gary dist. as assistant general superintendent.

Mr. Lineberry joined U. S. Steel's Gary



WEMCO PRODUCES CLEANER COAL, SAVES THE MIDDLING AND REDUCES YOUR REFUSE LOSSES BY AN EXCLUSIVE TWO GRAVITY SEPARATION TECHNIQUE

With Wemco's Two Compartment Drum Separator, a successful middling product from HMS is not just a shakey promise — it's a sure thing. Use of two different separating gravities is the right way to do the job *when you eliminate cumbersome duplicate equipment.* Wemco has developed a two gravity technique that uses little more equipment than a single stage.

Wemco's Two Compartment Drum Separates three products, each with a bonus to you:

1. **YOU UPGRADE YOUR PRODUCT** because one of the separating gravity baths can be chosen to keep out all the middling values.
2. **YOU REDUCE THE REFUSE LOSS** because the other separating gravity bath is independent and can be selected to keep the remaining coal in the middling for reprocessing, or separate sale.
3. **YOU PROFIT BY THE MIDDLINGS** by recrushing and return to the circuit or by direct sale.

Wemco's positive two stage heavy media separation method is fully explained in available literature. To learn what this can do for your plant, write today for your copy.

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district in 1920 as an accountant and was made payroll clerk for Gary Mines Nos. 2, 4, 5, 7 and 10. In 1921 he was promoted to cost accountant and in a 1922 promotion he advanced to assistant superintendent of Mine No. 12. In 1935 he became superintendent of Mines Nos. 4, 5, 10, 11 and 12. Three years later he became superintendent of No. 2 and in 1950 he was made assistant general superintendent of the Gary district. The following year he was appointed district superintendent.

W. J. Parton was appointed assistant to the president of the General Crushed Stone Co., Easton, Pa., last month. A former president of two coal companies, Mr. Parton assumed his duties October 17. He began a career in mining in 1939 as an engineer with the Lehigh Navigation Coal Co. After advancing to superintendent, general manager and vice president, he became the company's president in 1954. He recently had been president and board chairman of Panther Valley Coal Co., Lansford, Pa.

H. B. Jones, former general manager of the Imperial Smokeless Coal Co. mines in Quinwood, W. Va., has been appointed general manager of an Eastern Coal Corp. mine in Stone, Ky. The mine, one of the largest in eastern Kentucky, employs 600 men and produces son... 3,000 tons of coal daily. Mr. Jones began his mining career in 1927 with the New River Co. After 24 yr of service, during which he held a number of superintendent's jobs in several of the company's mines, he accepted the post of general manager at Imperial.

Ernest Phillips has replaced the late Grady Turner as superintendent of the Rochester & Pittsburgh Coal Co.'s O'Donnell mine, Four States, W. Va.

E. P. Sheriff has been appointed resident engineer of the Helen, W. Va., mines of Eastern Gas & Fuel Associates. Mr. Sheriff, a former draftsman at Eastern's Stotesbury No. 8 mine, succeeds Squire Barrett, who was transferred to Grant Town.

Obituaries

Joseph Littlefair, an Illinois mine superintendent, died in a Johnston City, Ill., hospital Sept. 27 from injuries suffered during a mine inspection. Mr. Littlefair was 51. His home was in Johnston City. He was superintendent of Old Ben Mine No. 9 at West Frankfort, Ill.

Col. John C. Groome Jr., a coal operator, died of a heart attack Oct. 3 in Philadelphia, Pa. He was 60. Colonel Groome for many years had been president of the Cranberry Improvement Co. which has mines near Hazleton. In 1943 he became chief of the Domestic Div., War Department general staff. He was later placed on inactive duty to help boost hard-coal production.

Robert Perry Tyler, 58, vice president in charge of sales at Macwhyte Co., Kenosha, Wis., died at home in Kenosha Oct. 2. Mr. Tyler was born in Roanoke, Va., Oct. 7, 1897. He joined Macwhyte in 1945 as general sales manager, was elected a director in 1946, and appointed vice president in 1947. Before working at Macwhyte, he had been employed by John A. Roebling's Sons, Trenton, N. J., and at A. Leschen & Sons Rope Co., St. Louis, Mo.

R. E. Lawson, 78, died at home in Harlan, Ky., Oct. 9, after a long illness. Mr. Lawson was part owner and one of the organizers of Cornett-Lewis Coal Co. He was also a chief in the Harlan-Wallens, Verda Coal Co. at Wallens, Ky. For years he had been head of the Harlan Coal Operators Assn. A civic leader much of his life, he had been active in school and church work. He was buried in Harlan.

Association Activities

Ralph H. Moore Elected To Head CPCPA, EBCA

At the joint annual meeting of the Central Pennsylvania Coal Producers' Association and the Eastern Bituminous Coal Association in Bedford, Pa., October 6 and 7, the following were elected to office.

Central Pennsylvania Coal Producers'

COST-CUTTING MEMOS:

AVOID POOR PUBLIC RELATIONS EXPENSE: When you're blasting near buildings, the ATLAS Rockmaster® System puts all the explosives energy to work on the burden . . . controls vibration, noise, flying rock and throw. Power is confined for greater efficiency. Permits bigger, money-saving blasts . . . reduces costly complaints.

COMPARE METHODS: Traditional blasting procedures, however satisfactory they seem, may actually waste explosives power in flying rock and spouting gas. Modern Rockmaster methods, pioneered by ATLAS, improve fragmentation and control throw . . . reduce backbreak, noise, and vibration . . . step-up efficiency and profits.

USE THE RIGHT CURRENT SOURCE: A blasting machine with inadequate output is the most expensive. The new ATLAS "Shotmaster" Condenser-Discharge Blasting Machine supplies plenty of power for complex circuits. Eliminates dependence on power lines. Provides every safety advantage, with simplified operation. Ask your ATLAS Representative about it.

KEEP UP WITH THE LATEST BLASTING TECHNIQUES: Rockmaster now offers Alternate Velocity Loading for improved breakage, greater efficiency. Rockmaster methods, so advantageous in stripping, are finding increased use underground. Get details from your ATLAS Representative. And send for "Better Blasting," Atlas' quarterly bulletin on latest methods.

IMPROVED, modern blasting methods boost production, ease handling, and net higher profits. Why not review your present blasting methods with your ATLAS Representative. He can probably suggest many cost-cutting ideas tailored to your specific needs. Atlas' periodical bulletin on latest methods and equipment is yours for the asking. Let us put your name on the mailing list for "Better Blasting," today.

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ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE

Offices in Principal Cities

Association: Ralph H. Moore, president; J. William Wetter, vice president; R. T. Laing, executive director and secretary; Walter A. Jones, treasurer; C. P. O'Neill, assistant treasurer; and Frank G. Smith, counsel.

Eastern Bituminous Coal Association: Ralph H. Moore, president; William H. Ritter, vice president; R. T. Laing, executive director and secretary; Walter A. Jones, treasurer; C. P. O'Neill, assistant treasurer; and Frank G. Smith, counsel.

These men were elected to CPCPA board posts: M. J. Ackerman, T. L. Aitken, L. C. Campbell, Heath S. Clark, H. J. Connolly, Nathan D. Cortright, A. B. Crichton Jr., M. Albert Evans, R. M. Hess, Dennis J. Keenan, John M. Kerr, John W. Krous, T. F. McCarthy, Ralph H. Moore, A. J. Palumbo, Richard Peale, W. H. Ritter, Charles M. Shoffner, L. D. Silverstein, R. T. Todhunter Sr., W. S. Weer, J. William Wetter and Walter S. Williams.

These were elected to EBCA board posts: Charles G. Berwind, Heath S. Clark, F. A. Fontyn, W. O. Gulbranson, Sam Light, J. W. McGinn, Ralph H. Moore, John Barnes Mull, Charles A. Owen, Rembrandt Peale Jr., W. H. Ritter, Charles M. Shoffner, Peter H. Tuttle, R. S. Walker, W. S. Weer, J. William Wetter, R. W. Wigton and Harold D. Woolridge.

EQUIPMENT APPROVALS

Twelve approvals of permissible equipment were issued by the U. S. Bureau of Mines in September, as follows:

Linton-Summit Coal Co.—Rebuilt Goodman Type 570 cable-reel shuttle car; three motors, two 10 hp and one 7½ hp, 250 v, DC; Approval 2-1081; Sept. 9.

Joy Mfg. Co.—Types 10SC11PE-1 and 10SC11PXE-1 cable-reel shuttle cars; five motors, three 15 hp and two 7½ hp, 250 v, DC; Approval 2-1082; Sept. 13.

Joy Mfg. Co.—Type 3JCM-4H continuous miner; seven motors, two 65 hp, two 7½ hp, one 10 hp and two 3 hp, 440 v, 3 phase, 60 cycles; Approval 2-1083A; Sept. 13.

Joy Mfg. Co.—Type 10SC12PXF-1 cable-reel shuttle car; five motors, three 15 hp and two 7½ hp, 500 v, DC; Approval 2-1084-A; Sept. 15.

Long Co.—Model 88 loader with PT Piggyback combination; two motors, one 20 hp and one 4 hp, 230 v, DC; Approval 2-1085; Sept. 16.

Fletcher & Co., J. H.—Type DFA7-C2-S4X-R2 roof control machine; one 15 hp motor, 250 v, DC; Approval 2-1086; Sept. 21.

Joy Mfg. Co.—Type XB30R-1E 30-in portable extensible belt conveyor; three motors, two 15 hp and one 25 hp, 250 v, DC; Approval 2-1087; Sept. 23.

Gorman-Rupp Co.—Mine water pumps; one motor, a choice of 1½, 2 or 3 hp, 250 v, DC; Approval 2-1088; Sept. 27.

Gorman-Rupp Co.—Mine water pumps; one motor, a choice of 7½ or 10 hp, 250 v, DC; Approval 2-1089; Sept. 27.

Mine Safety Appliances Co.—Type A76957 mine fire truck; one motor, 5 hp, 250 v, DC; Approval 2-1090; Sept. 28.

Enoco Collieries — Rebuilt Joy Types 5SC-7CE and 5SC-7CXE cable-reel shuttle cars; three 7½ hp motors, 250 v, DC; Approval 2-1091, Sept. 28.

Mine Safety Appliances Co. — Methane detector; Approval 813; Sept. 29.

One Equipment Approval appearing in the September Coal Age listings as a "TD crawler" is changed to read:

International Harvester Co.—Type TD-9 diesel crawler mine tractor with bulldozer or bullgrader; Approval 2406 issued under Schedule 24; July 26.

Anything Less is an Old-Fashioned Truck!

If you don't get all the modern advantages new Chevrolet trucks offer, you stand to lose money on the job today and at trade-in time tomorrow

Look at it this way. The more modern the truck, the more quickly and efficiently it does the job. And if it's loaded with ultra-modern features, you're bound to be farther ahead at trade-in time. Now look at the way Chevrolet fills the bill. Even so-called new trucks are old fashioned without all these Task-Force advantages!

Shortest stroke V8's* of any leading truck—the most modern truck engines money can buy! Their compact, short-stroke design means longer life, because of less friction and wear. Chevrolet's extra-rugged and dependable high-compression valve-in-head Sixes are ultra economical to keep humming. They squeeze more power out of a tankful of gas!

The latest in cab comfort and safety—High-Level ventilation, panoramic windshield, concealed Safety Steps—features that boost driver efficiency!

Most modern chassis features—new suspension, more rigid ladder-type frames, Power Brakes standard equipment on 2-ton jobs!

Work Styling—Here's heavy-duty styling that's matched to the job; modern styling that calls attention to your business! Your Chevrolet dealer has complete details. See him soon. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

**V8 standard in L.C.F. models, an extra-cost option in all others except Forward-Control models.*

NEW CHEVROLET Task-Force TRUCKS

CHEVROLET

Among the Manufac turers

Trio of Divisions Created In Johns-Manville Expansion

Johns-Manville began expanding and dividing its Industrial Products Div. into three last month. It named the new divisions Pipe Div., Packings & Friction Materials Div., and Industrial Insulations.

Three new general managers were named to head them. Robert F. Orth, a vice president of the company's sales corporation, was chosen general manager of the Pipe Div.; Francis J. Wakem was picked for the same post in the Packings & Friction Materials Div.; and Don L. Hinmon became general manager of the Industrial Insulations Div.

The expansion was expected to be finished Jan. 1. Actually it was a continuation of a program begun in 1946 to decentralize operations and at the same time expand mines and plants. The company has spent $20,000,000 on the program each year since World War II.

Appointment of Manager Kicks off AC Promotions

A round of new appointments and promotions within the sales organization of Allis-Chalmers Industries Group was kicked off in September after the company had appointed W. M. Wallace general manager of its general products division.

In order of succession these men moved up: Robert L. Halsted, Cleveland manager of Allis-Chalmers' central sales region since 1952, succeeded Mr. Wallace in the job of managing the company's processing-machinery department. Mr. Halsted was replaced in his old job as manager of the company's central sales region by V. L. Spinney. Mr. Spinney, who left a New York district manager's job for the new one in Cleveland, was replaced in New York by N. W. Landis, manager of the company's Detroit district. A. J. Mestier Jr., for 5 yr manager of the Syracuse, N. Y., district, succeeded Mr. Landis in Detroit. Then the company moved up John W. Becker, a Syracuse sales representative, to succeed Mr. Mestier and end the round of promotions.

Forging Expansion Reported By U. S. Steel Homestead Works

U. S. Steel's Homestead District Works disclosed recently that it has expanded its forging division. The program will round out the division's product lines and provide flexibility in producing special forgings for the armed services, turbine and generator rotors, heavy machinery parts, rolls and sleeves, and plant-maintenance equipment. The program also includes relocating and altering forging presses and installing heavy-duty machine tools.

ESCO Creates Export Division

The establishment of ESCO International, a new division to oversee export business, has been announced by Electric Steel Foundry Co., Portland, Ore. The division's main office in New York is directed by Ed. T. Hewitt. Branch offices have been opened in Portland, and in San Francisco, Calif.

Borg-Warner Gets New Division

Byron Jackson, west coast maker of pumps, oil tools and electronic equipment, became the Byron Jackson Div. of Borg-Warner Corp. Sept. 1. E. S. Dulin, president of Byron Jackson, was named president of the new division.

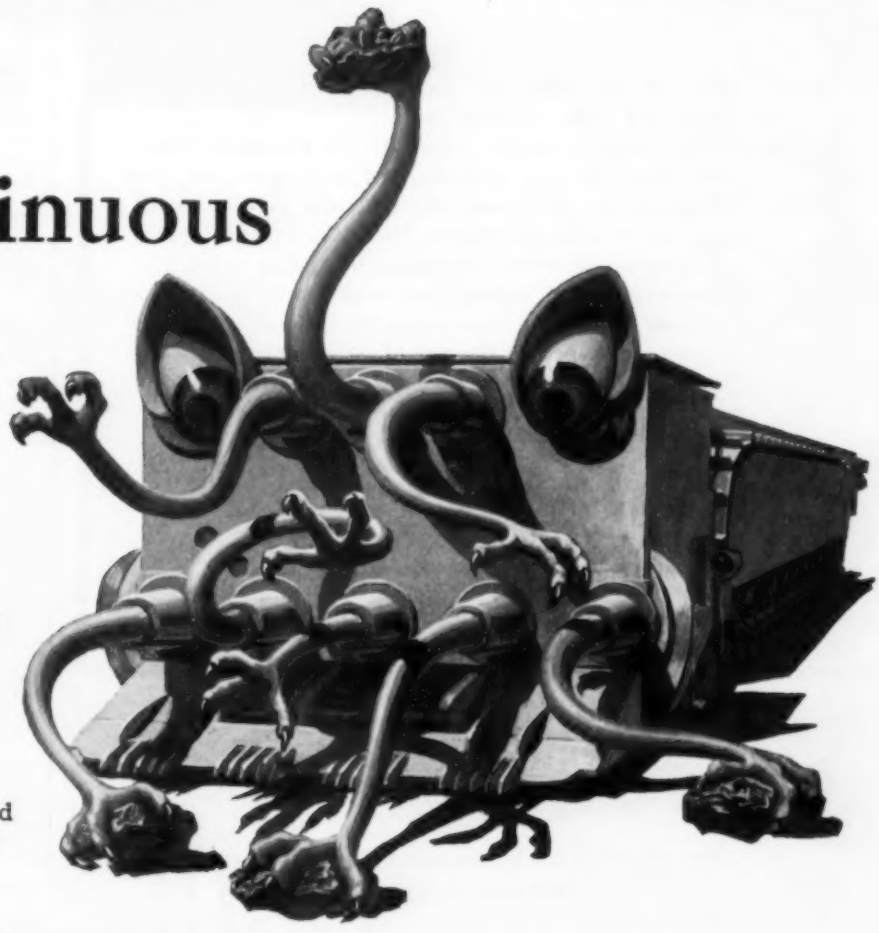
Goodman Names Pittsburgh District Manager

The appointment of K. E. Caine as district manager in Pittsburgh for the Goodman Mfg. Co., Chicago, Ill., has been announced by the company. Mr. Caine, a member of Goodman sales since 1934, recently became an assistant mining engineer. A job in 1925 as mining engineer for an Ohio coal company began a 30-yr career in the mining industry.

Peters Named Crusher Agent

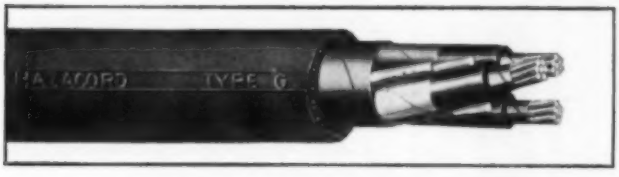
Crusher Engineering Division of Poor & Co., Philadelphia, Pa., has appointed

how to keep a continuous miner continuous



Continuous miners claw through a seam with amazing speed. That is, until there's a cable failure. Then you have a continuous loafer—an expensive piece of equipment to have lying around doing nothing. Get that loafer going again by introducing him to Hazacord, then they'll both be "going steady."

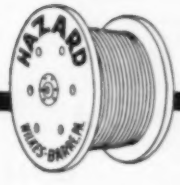
Hazacords are especially designed for continuous mining machines, either a-c or d-c operation. Insulation is heat- and moisture-resistant.



The cord mesh-reinforced sheath of flame-resistant Hazaprene ZBF is cured in a continuous metal mold for:
1. optimum vulcanization; 2. maximum density; 3. lasting toughness; 4. smooth, wear-resisting surface; 5. resistance to mechanical abuse; 6. controlled diameter.

Extra-flexible conductors in all Hazacord cables mean the greatest flexibility in every installation, while the overall rugged construction insures better service when exposed to rough handling, twisting, abrasion, oils, chemicals and acid mine water.

Write for Hazacord Mining Cable Catalog, Bulletin H-450, for complete information on the Hazard method of keeping miners continuous. Hazard Insulated Wire Works, Division of The Okonite Company, Passaic, N. J.



HAZACORD

mold-cured portable cables

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2419

the Wharton L. Peters Machinery Co., St. Louis, Mo., its sales agent. The Peters company will cover the entire state of Missouri and the southern counties of Illinois and Indiana. It will sell the entire Crusher Engineering line.

Morris Names Sales Agents

Two changes in sales territories of the Morris Machine Works, Baldwinsville, N. Y., have been announced by sales manager W. M. Mercer. Central Pennsylvania, formerly served by the late Walter L. Potter, Johnstown, Pa., will be served by the Ramsay Pump & Supply Co., Pittsburgh. Beginning Oct. 1, the Morris agent in southeast Pennsylvania will be Maleson Co., Philadelphia.

Thor Makes Artinger Manager

Harry L. Artinger, an industrial service engineer in the Pittsburgh, Pa., area for 10 yr, has been promoted to Pittsburgh manager by Thor Power Tool Co., Aurora, Ill. Mr. Artinger's new job puts him in charge of all Thor sales and service activities in the western half of Pennsylvania, southeastern Ohio and West Virginia.

Kaites Joins Long Sales Staff

John E. Kaites has joined the sales staff of the Long Co., Oak Hill, W. Va., and will represent the company in Pennsylvania and northern West Virginia. Mr. Kaites' headquarters are in Johnstown, Pa. He was formerly employed by Warner Collieries and by Ogleby-Norton Co. as resident engineer of Bruce mine.

Executive Promotions At Insley

Three new sales division appointments were made recently by the Insley Mfg. Co., Indianapolis, Ind. Fred B. Ray, vice president of sales, was appointed vice president of sales research and development. R. J. Boatman, factory sales representative, was named sales manager. C. W. Hoke was appointed advertising manager.

Appoint W. Va. Carbide Dealer

Baldwin Supply Co., Charlestown, W. Va., was appointed recently the authorized Carboloy carbide distributor of the Carboloy Dept., General Electric Co., Detroit. Baldwin's headquarters are at 207 Virginia St., W. The company will sell tools and blanks, diamond wheel dressers and masonry drills.

Haskell Retires

J. B. Haskell, market research and engineering development manager for West Virginia Steel & Mfg. Co., retired last month. A dinner in his honor was held Sept. 28 at the Prichard Hotel in Huntington, W. Va. During 33 yr with the steel company, Mr. Haskell had been in close contact with men in the coal industry and associated organizations. His duties have been divided among a number of departments in the company's organization.

Atlas Powder's Bruff Retires

Benjamin J. D. Bruff, Knoxville, Tenn., assistant to the director of explosives sales at Atlas Powder Co., retired Oct. 1. He

. . . . all in a day's work!

BECAUSE THE PAGE AUTOMATIC BUCKET IS BUILT FOR THE JOB!

After 8 years the bucket shown in the photo above is still on the job and going strong. The "RH" class is designed for digging in blasted rock, shale, compacted gravel, and hardpan, so we give it ample weight to insure penetration, and heavy toothpoints mounted in bases cast integral with the high-manganese steel lip to withstand the abrasion and strain it is expected to meet. Other standard classes available are the "RC" general purpose, "RM" medium, and "RL" light. Write Dept. "E" for bulletin GPB 454.

Page Engineering Company has designs, facilities, and experience, to build special purpose buckets such as slat — trenching — levee — and vee bottom to meet YOUR needs. Capacities — ⅜ to 40 cu. yds.

Page

Automatic Dragline Buckets
Diesel and Electric
Walking Draglines

PAGE ENGINEERING COMPANY - CLEARING POST OFFICE - CHICAGO 38, ILLINOIS

served the company more than 43 yr. A native of Baltimore, Md., Mr. Bruff had worked for the Knoxville sales office of the company since 1913. He joined Atlas in 1912 and for more than 17 yr had managed the Knoxville office. In 1954 he was appointed assistant to the company's director of explosives sales.

Baumgardner Heads Trabon Sales

E. W. Baumgardner has been appointed sales manager of the Trabon Engineering Corp., 1814 E. 40th St., Cleveland 3, Ohio, the company announced last month. Before joining Trabon, Mr. Baumgardner had been with Industrial Ovens, Inc., and National Carbon Co. In his new job, he will supervise national and international sales of centralized automatic lubrication systems.

Rome Cable Transfers Spriggs

Rome Cable Corp., Rome, N. Y., has announced the transfer of T. C. Spriggs to its Chicago office as sales representative. Before the transfer, Mr. Spriggs was sales representative in the company's central New York territory.

Goodman Appoints Newton

John S. Newton has been appointed vice president in charge of engineering at the Goodman Manufacturing Co. For the past seven years Mr. Newton has been with the Baldwin-Lima-Hamilton Corp., Eddystone, Pa., recently as vice president and manager of the Testing Equipment Div. Previously he had been an engineer at Westinghouse.

Middleton Named Manager

Laubenstein Mfg. Co., Ashland, Pa., has appointed Harold R. Middleton sales manager. Formerly with Wilmot Engineering Co. as manager of sales promotion and advertising, Mr. Middleton has been closely identified with the development and sale of coal preparation equipment in both the anthracite and bituminous coal industry for many years.

Goodman Fetes Old-Timers

Nineteen persons employed by the Goodman Manufacturing Co. in Chicago, Ill., were presented with diamond pins Nov. 2, at the company's tenth annual old timers dinner. Fifteen employees had completed 25 yr of service, four had completed 35 yr. With these presentations, the number of active employees who have reached the 35-year mark was 73. One hundred and thirty have been working for Goodman 25 yr or more.

And for your information . . . . .

E. M. Arentzen, president of the Lee-Norse Co., Charleroi, Pa., last month appointed Harry J. Fitzgerald to represent the company in southern West Virginia and eastern Kentucky. Mr. Fitzgerald had been employed in the area previously as a service and sales representative for the Jeffrey Mfg. Co.

Robert H. Rand was made sales engineer of Harnischfeger Corp.'s Construc-

tion and Mining Div. in Pittsburgh last month. Mr. Rand takes on the new job after 15 yr of experience with distributors of power cranes and shovels.

The St. Louis Heil Equipment Co., Overland, Mo., has been appointed Heil distributor for east-central Missouri and the Illinois counties of Greene, Jersey, Macoupin, Madison, St. Clair and Monroe. The company will sell Heil truck bodies and hydraulic hoists, "Colectomatic" and "Colecto-Pak" refuse collection units and "Heiloader" tailgate units.

Cross Sales & Engineering Co., Greensboro, N. C., has been appointed sales engineering representative for Cone-Drive Gears, Div. of Michigan Tool Co., Detroit, Mich. Cross will cover N. Carolina, S. Carolina, Virginia and W. Virginia.

The Howe Scale Co., Inc., Rutland, Vt., has appointed Philip C. Cook sales manager of the company's new Truck Div. Mr. Cook, a former sales engineer at Lewis Shepard Co., has been with the materials handling company for over 15 yr.

Benjamin F. Fairless, chairman of the executive advisory committee, U. S. Steel Corp., was selected as the 1955 recipient of the Award of Merit presented annually by the American Institute of Consulting Engineers.

Safety Tourney *(from p 121)*

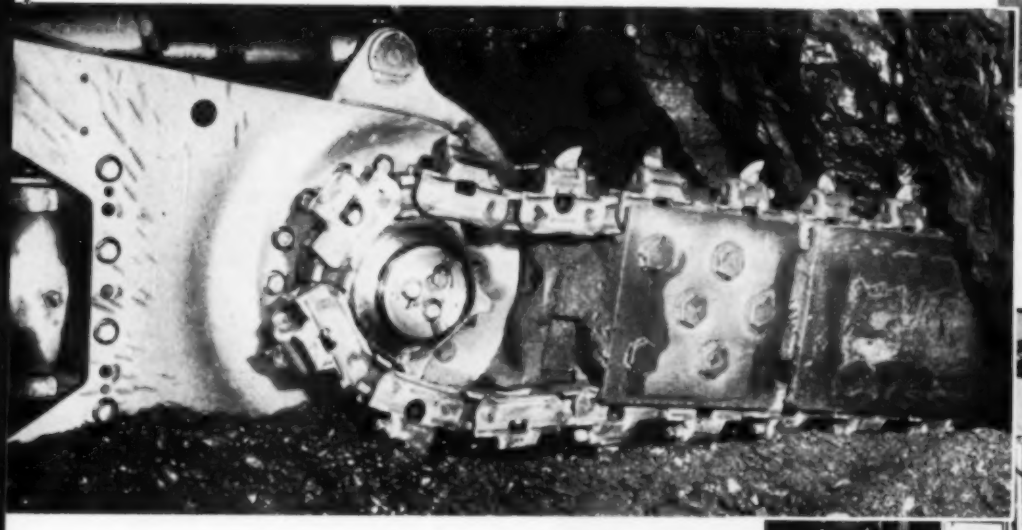
L. W. Schuler, assistant to the safety director, UMWA, was co-ordinating director. H. F. Weaver, chief, Div. of Coal Mine Inspection, was secretary; Robert Norcross, West Virginia Coal Association, was treasurer, and W. H. Tomlinson, training administrative officer, USBM, was announcer. Harry S. Homan, executive secretary and treasurer of the Southern Appalachian Coal Operators' Association, Knoxville, directed local arrangements.

COAL MEN ON THE JOB

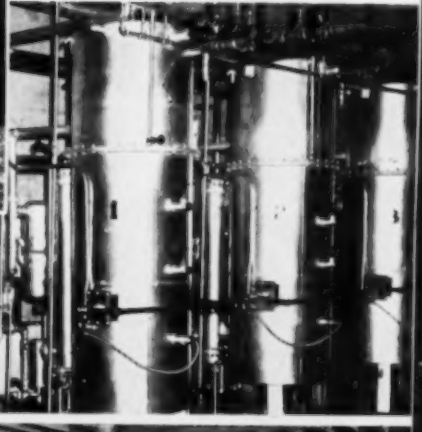
RED JACKET COAL CORP., Wyoming, Mine, C. L. Glover, district engineer, Wyoming, W. Va.

CINCINNATI'S*...

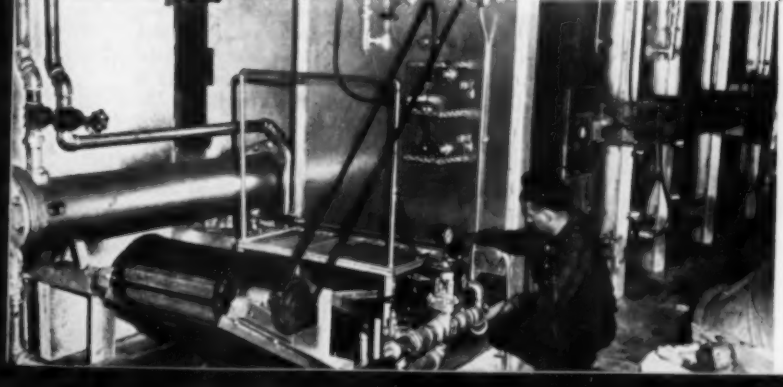
MODERN HEAT TREATING PLANT
GUARANTEES DEPENDABLE
PRECISION HEAT TREATING FOR ALL
CINCINNATI COAL CUTTING EQUIPMENT



ACTION PHOTO: Complete Cincinnati Mine coal cutting installation in one of America's largest coal mines.



OUR emphasis on the importance of heat treating of Cincinnati Cutting Equipment has prompted us to install one of the finest heat treating plants in the country and as a result, we are now doing heat treating for numerous outside companies who demand precision work. Rugged cutting equipment requires the finest of engineering and the employment of the best grades of alloy steels. Even the finest of steels however, will not perform satisfactorily unless given a scientific heat treatment which is attainable only with modern equipment supervised by men with years of technical and practical experience. In this respect, our heat treating department excels. Two of our top men are recognized leaders in the field of heat treating . . . with over three quarters of a century experience between them. There's no finer coal cutting equipment than CINCINNATI . . . may we be of service?



the CINCINNATI*
MINE MACHINERY CO.
CINCINNATI 25, OHIO

New Books for Coal Men

Fuel Cost Handbook

Fuel Cost Comparison Handbook explains in detail the method of computing quickly and easily the comparative annual cost that would be incurred by burning coal, oil or gas under identical conditions. Domestic, commercial and industrial applications are compared, including labor, equipment and maintenance costs. *50c. Available from the Canadian Commercial Coal Dock Operators Association, Toronto, Ontario.*

Engineering Materials

Handbook of Engineering Material, edited by John Seastone and Douglas F. Miner. A comprehensive work aimed to help engineers select the proper materials. Main divisions of the book include general information and standards, discussion of metals and many special-purpose alloys, details on non-metals and an analysis of the various construction materials. Information is arranged to permit easy comparison of competitive materials. *1,382 pp. $17.50, John Wiley & Sons, Inc. 440 4th Ave., New York, N. Y.*

Modern Arc Welding

Lessons in Arc Welding, The second part of a Hobart Bros. Co. text book, contains a series of practical exercises and instructions for developing and improving the technique of arc welding operators. The book includes preliminary instruction, starting and manipulating the arc, welding common joints with bare electrodes, welding light-gage sheets with coated electrodes, general welding with coated electrodes in flat, horizontal, vertical and overhead positions. *200 pp., $1, Hobart Trade School, Inc., Hobart Square, Troy, Ohio.*

Welding Library

A complete set of 13 basic books on modern welding practice together with personalized book plates is available for $10. If bought separately the books would cost $14.25. Titles and individual pieces are as follows: **Procedure Handbook** *($2 in U.S.A. $2.50 elsewhere);* **New Lessons in Arc Welding** *($1 in U.S.A., $1.50 elsewhere);* **Simple Blueprint Reading** *($1 in U.S.A., $1.50 elsewhere);* **Incentive Management** *($1 in U.S.A., $1.50 elsewhere);* **Weldability of Metals** *(50c in U.S.A., 75c elsewhere);* **Welding with Stainless Steel Electrodes** *(25c in U.S.A., 50c elsewhere);* **How to Repair and Build Farm Equipment** *(50c in U.S.A., 75c elsewhere);* **Design for Welding** *($2 in U.S.A., $2.50 elsewhere);* **Studies in Arc Welding** *($1.50 in U.S.A., $2 elsewhere);* **Welding Helps for Farmers** *($1 in U.S.A., $1.50 elsewhere);* **Setting Up and Operating a Welding Business** *(50c in U.S.A., 75c elsewhere);* **Arc Welding Lessons for School and Farm Shop** *($1 in U.S.A., $1.50 elsewhere);* **Metals and How to Weld Them** *($2 in U.S.A., $2.50 elsewhere);* **Available from The Lincoln Electric Co., Box 3115, Cleveland 17, Ohio.**

Buy a Dodge Truck and pocket the difference

Save first, and always, with a Dodge truck! New low prices bring famous Dodge dependability within the reach of every truck owner. What's more, Dodge work-proved long life and low operating costs mean extra savings over the years.

As for performance, Dodge offers you the greatest power line-up of any trucks on the road! Smooth-running Dodge Sixes are famous the world over for economy. New Dodge Power-Dome V-8's, with 169 to 202 hp., are the most advanced, most powerful engines in any leading trucks.

But see for yourself. Your dealer has a Dodge truck which will save you money and speed your work. See him today.

"Mile-after-mile economy"

Says JOHN G. JOHNSON
Walter S. Johnson Building Co., Inc.
Niagara Falls, N. Y.

"It's not just the low initial cost that keeps us sold on Dodge trucks—it's their mile-after-mile economy of operation that counts even more."

DODGE
Job-Rated
TRUCKS
WITH THE *FORWARD* LOOK

Diesel Operator's Guide by C. Morgan Jones. A book designed to keep diesel engines working on the line. Contains examples of how to cut operating costs that occur because of needless stoppages or faulty maintenance procedures. Latest diesel developments are covered. *389 pp. Illustrated. $6.50. McGraw-Hill Publishing Co., 330 W. 42 St., New York 36, N. Y.*

Developing Your Executive Skills, by Auren Uris, gives expert guidance on how to become a more effective and valuable executive. Includes chapters on decision making, long-range planning, executive problem solving, communication, working with subordinates, correspondence, interviewing, sharpening mental focus and memory. *270 pp. $4.50. McGraw-Hill Book Co., 330 W. 42nd St., New York, N. Y.*

COAL MEN ON THE JOB

WINGERT CONTRACTING CO., INC., Butler, Pa.—Merle Furlong, shop maintenance foreman.

News Briefs (*Continued from p 129*)

Fire Razes Utah Resin Plant

A Utah coal-resin plant in Bauer, Tooele County, has been razed by fire at a loss to its owner, Combined Metals Reduction Co., of $300,000. Ten thousand gallons of hexane went up in flames at the facility. It was the only such plant in the United States and will be rebuilt, CMR officials said.

Tipples Dynamiter Sought

A $5,000 reward for information leading to conviction in connection with the dynamiting of two coal tipples last month has been posted by the Central Pennsylvania Open Pit Mining Assn. Two blasts wrecked tipples of the River Smokeless Coal Co., Irvona, Pa., and the C. E. Powell Coal Co., Van Ormer, Pa., Oct. 9. Damage was estimated at $45,000

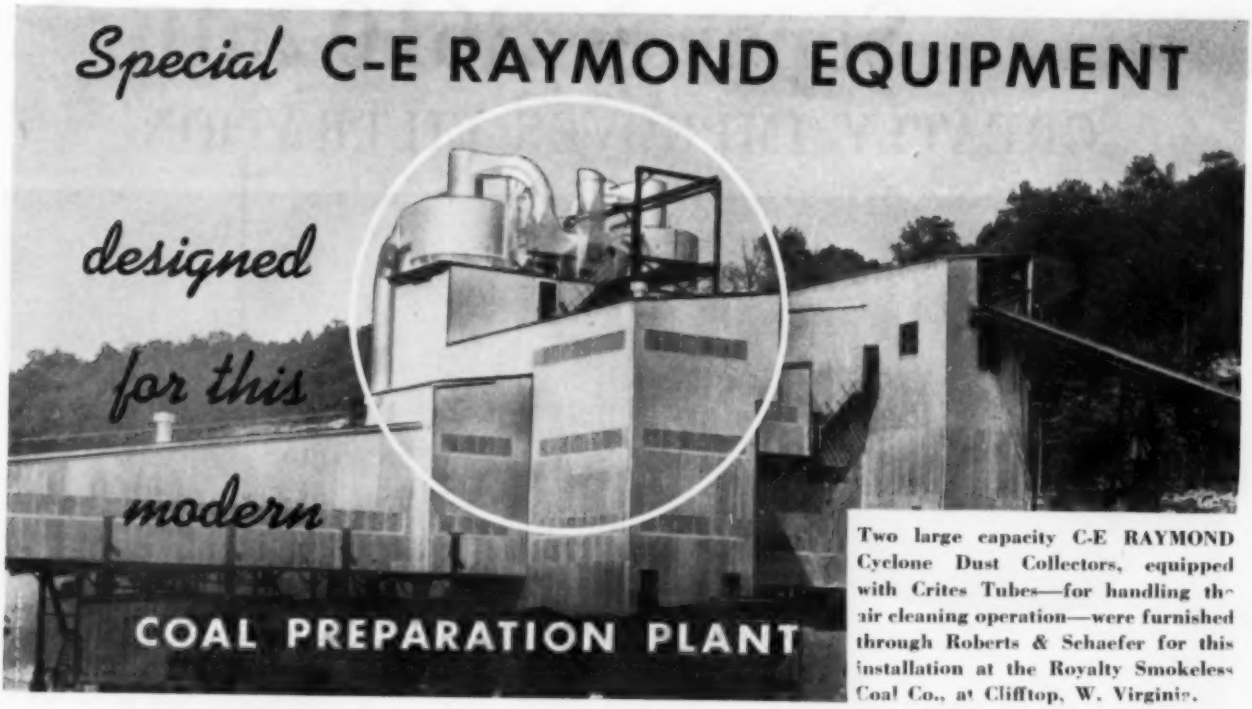
Coal Focus of Japan Crisis

Japan's coal industry has threatened to become the focus of a national economic crisis. Ailing for several years, the industry has already produced the first signs of a depression on Kyushu Island where 55%

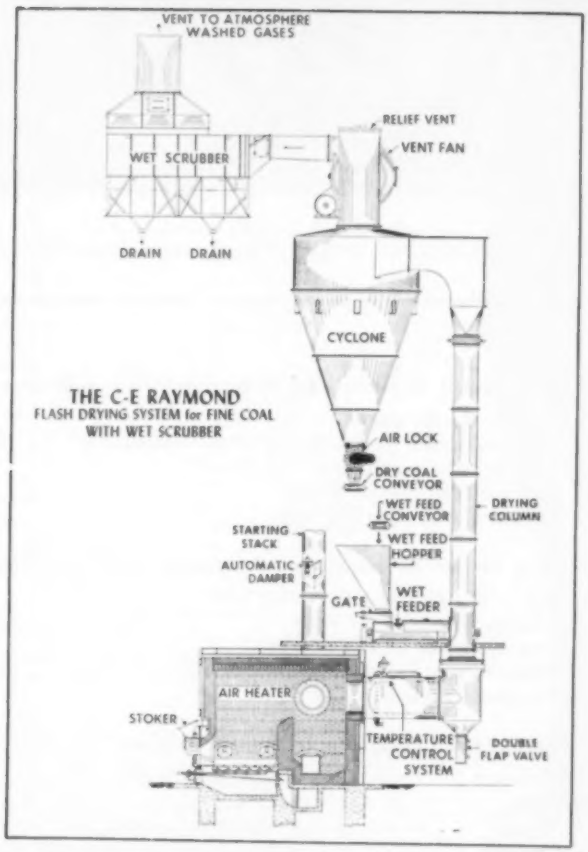
Special C-E RAYMOND EQUIPMENT

designed for this modern

COAL PREPARATION PLANT



Two large capacity C-E RAYMOND Cyclone Dust Collectors, equipped with Crites Tubes—for handling the air cleaning operation—were furnished through Roberts & Schaefer for this installation at the Royalty Smokeless Coal Co., at Clifftop, W. Virginia.



The C-E RAYMOND Flash Drying System is available also in complete units for drying fine coal in the ⅜" x 0 size range.

These units are built to suit the requirements of both large and small plants. With a single drying column, capacities of 10 to 100 tons per hour are obtainable. Multiple drying columns, connected to one furnace, are furnished to order for higher capacities.

Instantaneous drying action and the new type coal trap combine to eliminate the coal degradation problem, even in the softer coals. By means of a wet scrubber device, air pollution around the plant is kept within all local ordinance restrictions.

The smooth, clean, automatic operation with low power consumption and minimum maintenance costs, are advantages which are responsible for the widely increasing use of the C-E Raymond System of fine coal preparation.

For further details, write for Raymond Bulletin FD-51

COMBUSTION ENGINEERING, INC.

Raymond Division

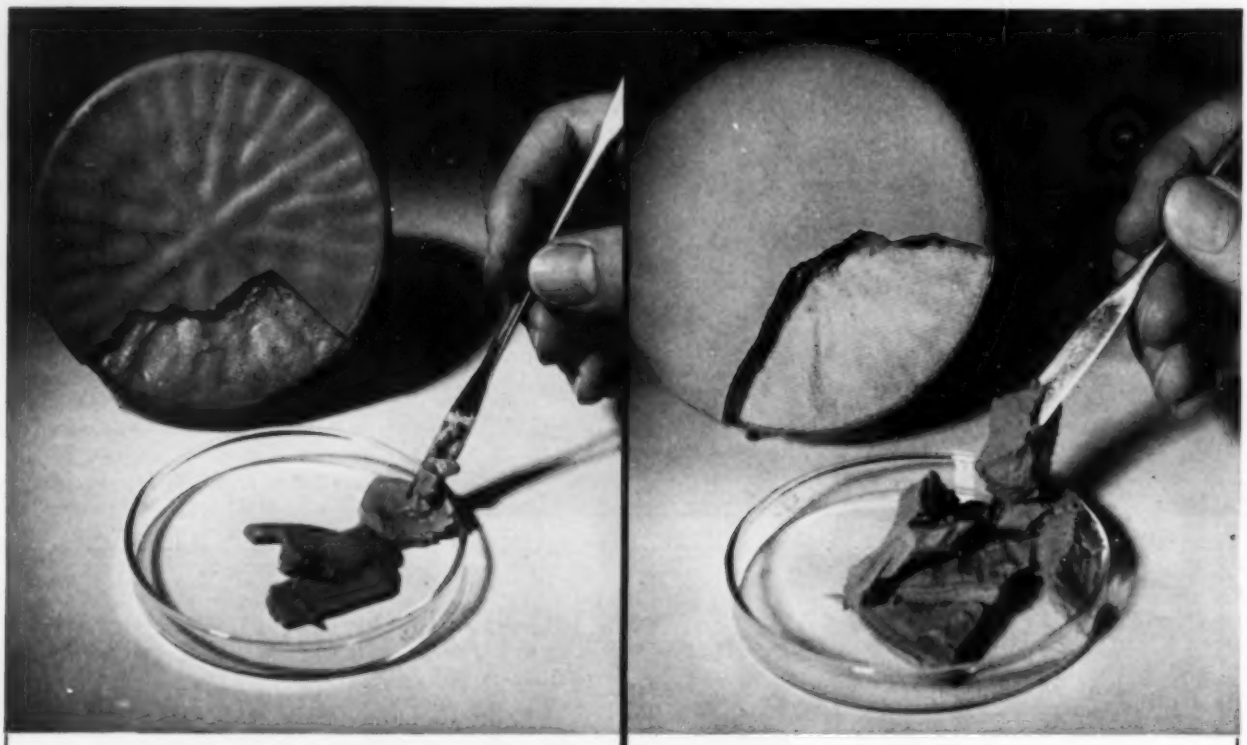
1315 NORTH BRANCH ST.,
CHICAGO 22, ILLINOIS

SALES OFFICES IN
PRINCIPAL CITIES

Combustion Engineering-Superheater, Ltd., Montreal, Canada

Separan 2610

GREATLY IMPROVES FILTRATION



Above picture shows thin cake formed on filter with untreated solids. Cycle includes 15-second cake formation and 45-second drying time.

During the same cycle, a much thicker cake is formed by treating with 0.15 lb. of SEPARAN 2610 per ton of dry solids present.

New flocculating agent speeds up filtration and settling rates, brings many other improvements to liquid-solid separations

THE DOW CHEMICAL COMPANY
Dept. TS-789F-2, Midland, Michigan

Please send me information and a trial sample of SEPARAN 2610.

Name_____

Company_____

Address_____

City_____ State_____

Prove to yourself the advantages of Separan* 2610 in filtration.

1. Increased cake size
2. Decreased cake moisture and better washability
3. Easy to handle and less dusty cake
4. Less material loss in filtrate
5. Effective over wide pH range

Prove to yourself the advantages of Separan 2610 in settling.

1. Up to 40 times faster settling rate
2. Increased overhead clarity
3. Less materials loss in overhead
4. Reduced cost in acid and alkaline media
5. Increased plant capacity

SEPARAN 2610 is highly effective in these industries:

- Uranium
- Clay
- Borax
- Cement
- Alum
- Potash
- Foundry Sand
- Coal
- Phosphoric Acid
- Iron Ore and Taconite
- Industrial Water, and Waste
- Miscellaneous Metals

*Trademark of The Dow Chemical Company

you can depend on DOW CHEMICALS

DOW

of Japanese coal is mined.

Unemployment and shut-down mines have had far reaching repercussions. Reduced tax collections have hampered government and public development.

The National Diet has met the problem by limiting oil consumption. It has also attempted to reorganize coal industry on more efficient lines.

Meanwhile Japan continues to import coal from the United States, coal that is cheaper because of a disproportionate labor cost in Japan that is related to daily output per man.

A two-month wage strike in 1952 added to the confusion. In the face of a coal shortage the government had urged oil as a fuel. As a result of an industrial conversion to oil, Japanese coal companies have never recovered. Coal output reached a peak of 46,430,000 tons in 1951. It has dropped since then to 40,000,000 tons. Last year 808 coal mines were operating in Japan. One hundred and forty have closed since then.

British Output Continues Fall

British coal output continued to fall last month behind that of last year. Production reached 172,166,600 tons, 3,268,400 tons lower than 1954. Saleable output of both deep mine and open pit coal in the week ending Oct. 15 was 4,995,900 tons, 3,300 tons more than the previous week and 17,100 tons behind the corresponding week in 1954.

British imports during the week ending Oct. 8 totaled 184,000 tons, raising the year's total imports to 9,137,200, compared to 1,686,200 for the same period last year.

British Strike Off-Shore Coal

The first major out-to-sea boring ever to be carried out in the United Kingdom has proved successful. After drilling five months the National Coal Board has struck coal 2,000 ft below the Firth of Forth and about 1¾ mi off shore from Kirkcaldy Fife, Scotland. The aim was to prove reserves under the sea and so gauge the extent of a new coal field at Seafield, the sinking of which began in May, 1954. Another boring will now be attempted 1½ mi farther out to sea with later borings scheduled off the Durham coast, and possibly also off the coasts of Cumberland, Kent and the Dee estuary of North Wales. They will be carried out from a sea-tower designed by the same firm who designed sea-forts during the war, Maunsell, Posford and Pavry.

Wester Coal Seen Useable

A Colorado coal expert, asserting that eight western states contain 12.4% of the coal in this country, said last month that western coal, although inferior, can be made into usable coke with proper processing.

The expert was John D. Price, superintendent of by-products coke plants, Colorado Fuel & Iron Corp., Pueblo, Colo. Speaking before delegates of the Rocky Mountain Minerals Conference, Mr. Price declared "the states of Colorado, Utah, Montana, New Mexico, N. Dakota, Texas,

Washington and Wyoming have within their borders 72.4% of the coal in the country." He added, "this coal, properly processed, could attract increasing numbers of industries to this section of the country."

"As it stands now," Mr. Price said, "we must face the fact that our western coals fail to measure up to the quality of eastern coals. The big difference is that western coal is lower in coke production."

Mr. Price said his company and others have found methods of increasing the amount of coke in certain types of western coals.

German Imports Top Exports

Western Germany imported more coal during September than she exported for the first time in her history. Her total imports were over 2,000,000 tons, 1,069,000 tons of it U. S. coal. The remainder was imported from Britain (120,000 tons a month), Poland and Czechoslovakia (100,000 tons a month). West Germany's coal exports, meanwhile, declined to 1,931,000 tons.

Chemicals May Stop Mine Acid

Solutions of phosphate or chromate sprayed on pyrite found in coal mines may halt the formation of sulphuric acid and, subsequently, the pollution of streams situated near coal mines, according to Water A. Patrick, emeritus professor of chemistry at Johns Hopkins.

Speaking at the Federation of Sewage & Industrial Wastes meeting in Atlantic City, N. J., last month, Mr. Patrick said that experiments have disclosed that hydrogen sulphide is always present in coal mines and that it triggers a reaction with pyrite to form sulphuric acid. Laboratory experiments, Mr. Patrick said, show that solutions of phosphate or chromate sprayed on pyrite may halt the formation of acid.

Suit Against UMWA Dropped

A $50,000 damage suit brought against the United Mine Workers of America in U. S. District Court was dropped last month on a motion of the plaintiff.

Warner Collieries and UMWA settled a dispute over seniority rights and ended a strike at Mammoth, W. Va. The coal company had charged that the UMWA had broken a contract by failure to settle the seniority dispute in accordance with an agreement signed with the Southern Coal Operators Assn.

Poor Combustion Pollutes Air

Proper fuel combustion was advanced as an important factor in air pollution problems by Ernest E. Finn, Philadelphia, Pa., during a meeting of the Staten Island Air Pollution Control Assn. last month. Scotching misconceptions about the villainous role of solid fuel, Mr. Finn said that "all fuels can be burned smokelessly."

Frozen Coal – Hard to Handle but easy to prevent!

Freezeproof your coal with Morton "Formula 5"

There's no need for your customers to spend money unloading frozen coal. It's easy to keep your coal free-running . . . keep your customers happy . . . by using Morton "Formula 5", the inexpensive freezeproofing compound made exclusively for the coal industry. Effective even at sub-zero temperatures, "Formula 5" ends costly delays in unloading frozen coal . . . saves your customers time, labor and money.

Morton "Formula 5" is economical to apply. It needs no mixing, no extra handling. It's a free-pouring, dry product composed of sodium chloride (30-70 mesh) and a special anti-corrosive compound. Just apply dry, direct to coal.

"Formula 5" gives you these extra benefits:

• Low cost of application • Scientifically treated to produce an ideal dissolving rate and minimize loss during initial draining • Will not lump in feeder • Contains a rust inhibitor to protect your equipment • Harmless to coal, harmless to hands and clothing • Can be used for conveyor equipment, switches, tracks, etc. • Readily available—comes in tough, 100-lb. bags.

Send for more FORMULA 5 information today!

MORTON SALT COMPANY
INDUSTRIAL DIVISION
Dept. CA-11 Chicago 3, Illinois

Please send me your free booklet, "The Key to Low Cost Freezeproofing Application."

*Name*_____

*Company*_____

*Street*_____

*City*_____ *Zone*_____ *State*_____

COAL MEN ON THE JOB

RED JACKET COAL CORP., Wyoming, W. Va.—Night shift group: Front row: Willard O'Neal (left) section foreman, Fred Thomas, general night foreman and Edward O. Smith, section foreman. Back row: Ira Bradford (left) maintenance foreman, Richard Butcher, section foreman and William Dalton, section foreman.

And For Your Information . . .

John H. East Jr., regional director of the U. S. Bureau of Mines, admitted last month that the government lost $100,000 worth of equipment in a mine cave in Feb. 28 at the oil shale experiment station near Rifle, Colo. In all, $300,000 worth of equipment was trapped in the cave in. Mr. East said two-thirds of the equipment either was not damaged or can be repaired at slight cost.

Publicker Industries, Inc., Philadelphia, Pa., has decided to use coal 100%. Total annual consumption is estimated at 250,000 tons.

Public Service of New Jersey has increased coal burning by about 10%, or about 200,000 tons.

Truax-Traer Coal Sales Co., Cincinnati, Ohio, Tepee coal producers, has been voted the "Joshua" award for the most distinguished use of match book advertising in the heating fuel industry in 1955, Charles Furcolowe, director of the Match Industry Information Bureau, has announced.

The Berwind-White Coal Mining Co.'s Maryland Shaft 2 mine situated near Wilmore, Pa., is being reopened after being closed down a year. Some 265 men had been employed before its closing.

A mine situated near Ehrenfeld, Pa., will be reopened in the next two months, according to L. D. Silberstein, president and board chairman of Penn-Texas Corp. The mine, No. 8, has been out of production for more than a year.

The Dominion Coal Co., Ottawa, has received an order from the United Kingdom for 220,000 tons of Nova Scotia slack coal, according to the Dominion Coal Board in Canada.

ON ALL NEW RELIANCE A-C. MOTORS

All new Reliance A-c. Motors provide these two essentials to trouble-free operation in hazardous or corrosive atmospheres . . .

POSITIVE PROTECTION

A pure neoprene gasket encloses each lead wire with an individually molded pressure knob. This gasket forms a positive protective seal between the motor frame and the corrosion-proof, cast iron conduit box.

POSITIVE IDENTIFICATION

Numbers on the pressure knobs and lead lugs correspond with a numbered wiring diagram on the stainless steel nameplate. Identification for installing or rewiring is positive and easy.

Another Reliance engineered development to assure industry a Totally-Protected, Precision-Built Motor!

Get in touch with your nearest Reliance sales office or distributor, or write for bulletin B-2401. *Reliance Electric & Engineering Co., 1063 Ivanhoe Road, Cleveland 10, Ohio; Canadian Division — Welland, Ontario.* B-1497

RELIANCE ELECTRIC AND ENGINEERING CO.

PROFESSIONAL SERVICES

NEWELL G. ALFORD
Consulting Mining Engineer
Coal Property Prospecting
Development, Operation and Valuation
Oliver Building — Pittsburgh 22, Pa.

J. H. FLETCHER
39 Years
Continuous Consulting Service to Coal Mines
Telephone HArrison 7-5151
332 S. Michigan Ave. — Chicago 4, Illinois

DAVIS READ
Consulting Engineer
Layout — Operation
Modern Production Methods
Plant Design — Preparation
120 S. La Salle St. — Chicago 3, Ill.

ALLEN & GARCIA COMPANY
42 Years' Service to the
Coal and Salt Industries and Consultants
Construction Engineers and Managers
Authoritative Reports and Appraisals
332 S. Michigan Ave., Chicago
120 Wall Street, New York City

KIRK & COWIN
Ralph E. Kirk — Percy G. Cowin
Registered Professional Engineers
Consulting—Reports—Appraisals
Mechanical Mining of Ore & Coal
Management and Construction of Mines
1—18th St., SW — Birmingham, Ala.
Phone 56-5566

ROBINSON & ROBINSON
Consulting Engineers
Mine Operation — Preparation
Coal Property Valuation
Industrial Engineering
Union Bldg. — Charleston, W. Va.

GEO. S. BATON & COMPANY
"Founded 1900"
Consulting Engineers
Cost Analysis — Valuations
Mine and Preparation Plant Designs
1100 Union Trust Building — Pittsburgh 19, Pa.

HERBERT S. LITTLEWOOD
Consulting Engineer
Application—Supervision of Installation
Maintenance—Inspection—Testing
POWER-HAULING HOISTING
VENTILATION
R. D. #3, Irwin, Pa.

TEMPLETON-MATTHEWS CORPORATION
Designing Engineers—Consultants
Builders
MODERN COAL PREPARATION PLANTS THRU "CO-OPERATIVE ENGINEERING"
906-08 Sycamore Bldg. — Terre Haute, Indiana

EAVENSON, AUCHMUTY & SUMMERS
Mining Engineers
COAL OPERATION CONSULTANTS
VALUATION
2720 Koppers Bldg. — Pittsburgh 19, Pa.

J. B. MORROW
Coal Consultant
Oliver Building — Pittsburgh, Pa.

PAUL WEIR COMPANY
Mining Engineers and Geologists
Consultants and Managers
DESIGN and CONSTRUCTION
20 North Wacker Drive — Chicago 6, Illinois

J. W. WOOMER & ASSOCIATES
Consulting Mining Engineers
Modern Mines Systems and Designs
Foreign and Domestic Mining Reports
National Bank Building — Wheeling W. Va.
Henry W. Oliver Bldg. — Pittsburgh, Penna.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: BUSINESS: **"OPPORTUNITIES"** :EQUIPMENT :USED OR RESALE

UNDISPLAYED RATES DISPLAYED

$1.20 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted undisplayed rate is one-half of above rates, payable in advance.

Box Numbers in care of our offices count as one additional line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Equipment Wanted or For Sale Advertisements acceptable only in Displayed Style.

The advertising rate is $10.20 per inch for Equipment and Business Opportunity advertising appearing on other than a contract basis. Contract rates quoted on request.

Employment OPPORTUNITIES—$12.80 per inch, subject to Agency Commission.

Send New Ads to N.Y. Office, 330 W. 42nd St., N.Y. 36, N.Y. for December issue closing November 17th

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Wanted: Qualified person to take charge of maintenance department, responsible for maintenance and repair of all underground equipment of large coal mining operation. Electrical or mechanical engineer preferred. Anyone interested should contact Inland Steel Company, Wheelwright, Kentucky.

Engineering Draftsmen-Electrical for bituminous coal mining company in Penna. The applicant must be familiar with the application of electricity to mining uses. The work will consist of designing substations, transmission lines etc. The applicant must give education, experience, age, physical condition and state salary expected. A technical education is desirable but not essential. P-8064, Coal Age.

POSITIONS WANTED

Mining Engineer—Retired, 40 years experience; well acquainted with Illinois and mid-western coal fields; available for consultations, inspections and reports. PW-7131, Coal Age.

POSITION VACANT

Graduate electrical engineer, preferably under 30, to work directly under the Superintendent of Power and Mechanical Department for the Wheelwright and Price mechanized mines.

INLAND STEEL COMPANY
Wheelwright, Kentucky

Position Wanted—Coal mine general superintendent or superintendent. 24 years' experience in all types and phases of coal mining. Thoroughly experienced in mobile, track and belt mining. References on request. PW-7998, Coal Age.

BUSINESS OPPORTUNITY

Strip Coal Wanted

Lease or purchase—large or small tracts. Morgan Coal Company, 2870 North Meridian Street, Indianapolis 8, Indiana.

WANTED

ANYTHING within reason that is wanted in the field served by Coal Age can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

LEGAL NOTICE

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF

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McGRAW-HILL PUBLISHING COMPANY, INC.
By J. A. GERARDI, Vice Pres. & Treas.

Sworn to and subscribed before me this 15th day of September, 1955.
[SEAL] ELVA G. MASLIN.

(My commission expires March 30, 1956)

CAT TRUCKS

1—Goodman Cat truck, 220 volts, AC.
3—Joy T1-3PE Cat trucks, 250 volts, DC.

HOISTS

1—400 HP Stearns-Roger Single Drum Hoist, Capacity for 5500 Ft. 1⅛" Rope.
1—150 HP Ottumwa Conical Drum Hoist.
1—50 HP Clyde Iron Works Single Drum Hoist.

COPPER

Approximately 15,000' 2/conductor, 2/0 5000 volt trenchlay cable as good as new, wrapped on reels 300'-500' long.
Several 1000 ft. reels of 3/conducter, 2/0 armored lead covered 2300 volt cable.

CRUSHERS

2—20 x 24 Jeffrey Flextooth crusher. Can be used for any size coal.
3—36 x 36 Jeffrey single roll crushers.
2—18 x 18 McNally Pittsburg double roll stoker crushers.
1—20 x 24 McNally Pittsburg single roll crusher.
1—24 x 48 McNally Pittsburg double roll crusher, newest type, only used approximately 30 days, good as new with steel base and V belt drive.
1—Type AC-3A American Pulveriner crusher.

FANS

1—5' Jeffrey Aerodyne Fan.
1—4' Jeffrey booster fan, ball bearing, new type, without motor. We can furnish any size motor to run the fan any speed you wish.
1—7' Joy Fan, type H-111-36, like brand new.

LOADING MACHINES

1—8 BU Joy, 220 volts, AC., Permissible.
1—8 BU Joy, 250 volts, DC., #2974, practically new, Permissible.
3—11 BU Joy Loaders, type 10APE, 250 volts, DC., Permissible.
3—8 BU Joy Loaders, 250 volts, DC.

LOCOMOTIVES

3—15 ton MH77 Jeffrey ball bearing armature locomotives, complete with hydraulic brakes. New in 1947, used 2 years, as good as new. Complete specifications as follows:
42" gauge, overall dimensions, length 16' 8", width 5' 4½", wheelbase 6' 4", height 42". Heavy duty equipment making locomotive weigh approx. 17 tons.
3—15 ton MH77 Jeffrey ball bearing armature locomotives, 42" gauge, not with hydraulic brakes, late type, as good as new. Dimensions: length 16' 8", width 5' 4½", wheelbase 6' 4", height 42". Heavy duty equipment making locomotive weigh approx. 17 tons.
1—10 ton MH143 Jeffrey locomotive, complete with ball bearing journals and armatures, #7575, 42" gauge. Overall height 34", length 14' 2", with 61". This locomotive was used very little. Just like new, and we have an extra set of new armature field coils and new parts worth several hundred dollars.
2—10 ton General Electric, ball bearing, 48" gauge.
2—8 ton Jeffrey ball bearing journals, and motors, 48" gauge.
25—6 ton MH 88 Jeffrey, ball bearing, 42" gauge.
1—8 ton Goodman, type 91K42-54T, 42" gauge, 27" high, new in 1950, used only 6 months.
12—6 ton Mancha Battery Locomotives, 42" gauge, 42" high overall. Sold with or without batteries.
All Electric locomotives 250 volts DC.

MINING MACHINES

1—512 EJH Goodman, 250 volts, DC, permissible, 8½' cutter bars with hydraulic jacks and bug dusters, complete with Joy T1 cat trucks.
1—29UR Jeffrey Mining Machine, 250 volts, DC, 9' cutter bar, #26531.
1—512 EJ Goodman 250 volts, DC, permissible, 8½' cutter bar, complete with Goodman bug duster, and Goodman MAT Cat truck.
6—7B-1 Sullivan, 250 volts, DC, 8½' cutter bars, complete with bug dusters, permissible with Joy T1 Cat trucks.

MOTOR GENERATOR SETS

1—300 KW Ridgeway Motor Generator set, 2300 volts AC end, 275 volts DC end, complete with switchboard as good as new.
1—200 KW General Electric motor generator set, 1200 RPM, 2300 volts AC end, 250/275 volts DC end, complete with automatic circuit breaker, late type.
3—200 KW Westinghouse motor generator sets, 900 RPM, 2300 volts AC end, and 250 volts DC end.
3—150 KW General Electric motor generator sets, 2300 volts AC end, 250/275 volts DC end.
3—150 KW Westinghouse motor generator sets, 1200 RPM, 2300 volts AC end, 250/275 volts DC end. Above sets all complete with either fully automatic switchboards or manual starters and automatic circuit breakers.

ROCK DUSTERS

3—MSA Type S rock dusters, 20 HP, DC motors, 230 volts, 42" gauge tracks.
1—MSA Bantam rock duster, 90 volts, DC.

ROTARY CONVERTERS

2—300 KW Allis Chalmers Rotary Converters, volts 185, amps 600, 6 phase, 60 cycle, 1200 RPM DC, volts 250, amps 1200, complete with manual starting equipment and transformers, as good as new, tested by a large electrical shop.
1—200 KW General Electric synchronous Rotary Converter #4098237, type HCC-6-200-1200, 1200 RPM, 60 cycle, 275 volts, 727 amps. Steel base complete with transformers, in perfect condition. As good as new.

SHUTTLE CARS

4—58C Joy shuttle cars with elevating discharges.
6—42D Joy battery type shuttle cars.
2—Jeffrey MT 65 B 2 8K Shuttle Cars. Practically brand new.

VIBRATORS

2—4' x 10' Selectro single deck vibrators, can be made two deck.
1—6' x 14' Robins-Gyrex double deck vibrator.
1—4' x 12' Deister single deck vibrator.
1—4' x 10' Stephens-Adamson two deck vibrator.
2—3' x 6' Simplicity single deck vibrators.
4—5' x 14' Tyler T-600 double deck vibrators.
1—5' x 10' Tyler T-600 single deck vibrator.

GAVENDA BROTHERS, INC., Canton, Ill.

MINE EQUIPMENT FOR SALE

1—29U Jeffrey, Track Mtd., Cutting Machine, 250 V DC, Duel Control
1—10-ton Jeffrey Locomotive, Serial #7338
2—13-ton Jeffrey Locomotive, Serial #3956 & 6562
1—6-ton G. E. Locomotive, Serial #9702
1—10-ton G. E. Locomotive, Serial #10419
1—8-ton Jeffrey Locomotive, Serial #5712
1—8-ton G. E. Locomotive, Serial #6687

PUMPS:

2—5 x 5 Aultman Pumps, 2" Dis, 2" S. trc'k md. w/or w/out motors
1—Lot up-rite sump pumps, Emglo & Fairbanks-morris w/ 1/3 HP Motors
5—Gorman-Rupp Sump Pumps, 1" S. 1¼" D. w/ ¼ HP built-in motors, 250 V DC
1—Gasoline Powered Pump, Portable, 1½" D, 1½" S. w/ 1½ HP Lawson air cooled engine
1—lot 1, 2, & 3" Plastic pipe, New & Used

POWER EQUIPMENT:

1—300 KW Rotary set, Ridgeway, w/3-100 KVA Transformers 2300-100/200
1—150 KW M-G set, Ridgeway
3—30 KVA Transformers, Volts, 2300-230/460
3—50 KVA Transformers, Volts, 2400-240/480
1—2 KVA Transformers, Volts, 2200-110/220
2—25 KVA Transformers, Volts, 2200-244/488
1—3 KVA Transformers, Volts, 2200-220/110

MISCL. EQUIPMENT

1—Hyd. Rail Straightener, 250 V DC
5—A-7 Jeffrey Coal Drills, 250 V DC, Permissible
1—MSA Permissible Rock Duster, Serial #419 Track Mtd.
1—Lot AC and DC Motors, 1/3 HP to 75 HP
1—Lot Locomotive tires & parts
1—Lot New & Used steel Mine ties, 40# & 60#
1—Lot Model P, Cap Lamps, Wolfe Flame Safety Lamps, MSA trip lights.
1—Lot 5 ton industrial jacks, Simplex & Duff-Norton
1—Lot Anusl & Fyr-Fyter Extinguishers.
300 ft. NMS. Spliced #2-2 Cond. Flat M. M. Cable
1000 ft. Size 2, 1 Cond. 133 Str. Loco Cable
1—Lot of Over-head hoist, 1 to 5 Ton Capacity Tipple Equipment

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Farland Fuel Company

Katherine Mine,
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Phone 301 Shinnston or
8448 Morgantown, W. Va.

NEW and REBUILT STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Tons 18" to 56½" Track Gauge.
GREENSBURG MACHINE CO.
Greensburg, Pa.

DRILL

50-R Bucyrus Erie Electric Rotary Drill, Used less than 1000 hrs. Drills up to 12" holes.
FRANK FAMALETTE EQUIPMENT COMPANY
Box 325, Hazleton, Pa. GL 5-4708

FOR SALE
MINING EQUIPMENT

That includes 1—8BU Joy Loader; 5—42E Joy Shuttle Cars; 5—10 ton 36" gauge and 1—4 ton 36" Ga. Locomotives; 5—M.G. Sets—100 to 200 K.W. 2300 Volts A.C. (All electric equipment 250 volts D.C.); 250—1½ ton 36" Ga. Timken bearing mine cars; 1—electric hoist complete with 400 H.P. motor; 1—Sullivan 7B and 2—Goodman 512 cutting machines; 1—T-1 Cat. Truck; 40 sets of 33" Ga. 12" wheel Timken Bearing mine car trucks that were never used; 2—8 ton Goodman locomotives 33" ga.; 200—33" Ga. wood mine cars. WRITE

PANTHER CREEK MINES INC.
or Phone 2-3112 or 2-4131
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Springfield, Illinois

-TRANSFORMERS-

BOUGHT AND SOLD

We carry a large stock of rebuilt and guaranteed transformers, and invite your inquiries.

Custom-built transformers and coils manufactured to your specifications.

***Expert Repair Service*—all makes and sizes of transformers rewound, repaired and redesigned. Ask for our price schedule.**

THE ELECTRIC SERVICE CO., INC.

5322 Hetzel St. **Cincinnati 27, Ohio**

40 Years' Dependable Service

FOR SALE

30 drop bottom American Car & Foundry 48" gauge all steel mine cars.

Bed	12' x 6'9"
Length	14'6"
Height	30"

Water Level Capacity 142.2 Cu. ft.
Door Opening Sequence 1-2-3

These cars were new in 1948 and still in excellent condition.

BRADFORD COAL COMPANY
BIGLER, PA.

SEARCHLIGHT SECTION

BONDED EQUIPMENT BARGAINS

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IMMEDIATE SHIPMENT FROM STOCK

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Complete sections quickly and easily joined together. We take our loss on our stock of short length belting. You can save as much as 50% on the **BONDED CONVEYOR SPECIALS** listed, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2⅛" or 2-7/16" diam. shaft. Belt is new 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

Belt Width	Length of Conveyor	List Price	Sale Price
18"	25'	$1327.	$ 739.
18"	45'	1986.	1085.
20"	45'	2122.	1145.
20"	60'	2689.	1426.
24"	25'	1428.	835.
24"	45'	2227.	1237.
30"	25'	1535.	915.
30"	65'	3349.	1856.

Other lengths and belt widths at bargain prices.

NEW CONVEYOR BELTING
Save 25%

Heavy duty 4-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom cover rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.

Width	List Price	Sale Price
18"	$4.27 foot	$3.19 foot
20"	4.69 foot	3.69 foot
24"	5.55 foot	4.14 foot
30"	6.77 foot	5.06 foot

Additional widths and plies available at low prices. Write for free sample.

NEW IDLERS & RETURN ROLLS
25% Below List Price

3-roll, 5" diameter Troughing Idlers for			
18" belt	$19.00	30" belt	$20.50
20" belt	19.25	36" belt	21.25
24" belt	19.75	48" belt	23.75
1-roll, 5" diameter Return Idlers for			
18" belt	$7.50	30" belt	$ 8.75
20" belt	7.75	36" belt	9.25
24" belt	8.00	48" belt	10.75

All steel. Interchangeable with other well-known makes. Replaceable ball bearings. Either sealed type (pre-lubricated) or with alemite fittings. Maintenance is negligible.

NEW BONDED® COAL CRUSHERS

Double and single roll models. Types to produce ¾" stoker and others to crush up to 8" resultant. Capacities from 15 to 500 tons per hour. Steel hoppers included.
Priced from $479.00

NEW BONDED® VIBRATING SCREENS

For sizing and separation of Coal and many other uses. Shaft is mounted on self-aligning bearings. Made in eccentric weight and heavy duty eccentric shaft types: 1 to 5 decks, 3'x8' to 5'x14'. Others from 2'x4'. Wire cloth or plate included in price. Priced from $355.00

BONDED® PREPARATION PLANT

For cleaning coal with or without crushing. Easily moved. Ideal for strip coal operators. Improved design can include vibrating shaker screen, refuse pans, all conveyors, storage hopper, feeder, single or double roll crusher, picking table, frames, walkways and floor plates, complete with motors and drives. Prices vary depending on capacity and results wanted and are priced from $5700.00. One $7500 model in stock to close out at $3250.00. Full information in Bulletins 951 and 1023. Write for them.

WRITE FOR CATALOG AND PRICES

BONDED SCALE AND MACHINE CO.

2190 S. THIRD ST. COLUMBUS 7, OHIO

PHONES: Hickory 4-2186; FR 6-8898, Evenings

IRONTON
Electric Locomotives

New and Used

The Ironton Engine Company

Farmingdale, New Jersey

(formerly IRONTON, OHIO)

SHOVELS DRAGLINES ROTARY DRILLS

190-B B-E 8 yard electric shovel. Like new.
170-B B-E 5 yard electric high lift shovel.
170-B B-E Standard electric shovel.
1600 P&H 6 yard electric shovel.
2400 Lima H. L. diesel shovel 67' boom, 50' stick 4 yard dipper.
2400 Lima 6 yard electric shovel.
120-B Bucyrus-Erie electric 5 yard shovel.
1400 P&H 4 yard electric shovel.
111M Marion 4 yard diesel shovel.
4161 Marion 5 yard electric shovel. Worked about three years.
1201 Lima Hi-Lift diesel shovel 42' boom, 32' stick, 2½ yard dipper. Also drag.
1201 Lima Semi-Hi-Lift diesel shovel, 36' boom, 27' stick, 3 yard dipper.
3500 Manitowoc Hi-Lift diesel shovel 45' boom, 35' stick, 2 yard dipper.
111-M Marion Hi-Lift diesel shovel 43' boom, 34' stick, 3 yard dipper.
40-A Marion Hi-Lift diesel shovel 45' boom, 34' stick, 2½ yard dipper.
7400 Marion electric dragline 200' boom, 8 yard bucket.
450-W Bucyrus Erie diesel dragline 165' boom, 13 yard bucket.
625 Page diesel dragline 150' boom, 9 yard.
5-W Bucyrus Erie diesel dragline 125' boom. 5 yard bucket.
2400 Lima diesel dragline 130' boom, 5 yard.
4500 Manitowoc diesel dragline 120' boom, 5 yard bucket.
1055 P&H diesel dragline 80' boom, 4 yard.
1201 Lima diesel dragline 85' boom, 3 yard.
3500 Manitowoc diesel dragline 85' boom, 2½ yard bucket.
955 P&H diesel dragline 85' boom, 2½ yard.
2000 Manitowoc 1½ yard diesel shovel.

ALSO MANY SMALLER SHOVELS & DRAGLINES

50-R-B-E Blast Hole Drill—to 12" dia. hole.
Reich 600 Heavy Truck Mounted Rotary Air Drill.
58-BH Joy Champion Rotary Air Drill.
56-BH Joy Middle Weight Rotary Air Drill.
ALSO 42-T, 29T, AND 27T WELL DRILLS.

FRANK SWABB EQUIPMENT CO., INC.

313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

FOR SALE

7 Goodman 512 Permissible Cutting machines with Bugduster 9½ ft. bar 220/440 volts A.C.
5 Jeffrey 35 BB Cutting machines with 7½ ft. bar 220 V. A.C.
14 Joy Shaker Conveyors Model U 17 with 15 H.P. A.C. Motor. No pans.
10 Goodman G 20 Shaker Conveyors with 20 H.P. 220/440 V. A.C. Motors. Have pans.
15—25 KVA West. Dry type transformers 2400/4160 to 120/240 V.
7—10 KVA Ditto
12,000 ft. #8—3 cond 3000 V. Neoprene Cable
10 Capacitors 7½ KVA 230 V. 3 ph 60 cy.
11 Capacitors 15 KVA 2400 V. 1 ph 60 cy.
1—4500 Watt Office Heater 230 V.
3—3000 Watt Office Heaters 230 V.

RODEN COAL COMPANY

MARVEL, ALABAMA

New Peerless Portable SUBMERSIBLE PUMPS

PUMP RATINGS: 120 GPM @ 63' total head; 200 GPM @ 47' total head; shut-off pressure 87' total head. MOTOR RATINGS: 4 HP, either 115 or 230 volts DC. Compound wound, class "A" insulation, constant speed, continuous duty, water cooled. Full load speed 3200 RPM. Between pump and controller, 115 volt models have 30' of 4-conductor type FCOP-23 cable, and 230 volt models have 45' of 3-conductor type TCOP-23 cable.

WEIGHTS: Pump, motor and strainer—120 lbs. net. Shipping weight of complete pump—180 lbs.

THE BOSTON METALS CO.

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Baltimore 2, Md.
Curtis 7-5050

ROTARY CONVERTERS

500 KW (2) G.E. HCC6-275 v. DC 1200 RPM with Transformers.
300 KW G.E., HCC6-275 v. DC 1200 RPM with Transformers.
300 KW Westgh. 275 v. DC 1200 RPM with Transformers.
200 KW G.E. HCC6-275 v. DC 1200 RPM with Transformers.

M-G SETS, AC & DC MOTORS.
TRANSFORMERS, ANY SIZE.

MOORHEAD ELECTRICAL MACHINERY CO.

OAKDALE, PA. PHONE OWENS 3-6401

FOR SALE
SHORTWALL MACHINES

2—Model 512, 250 Volt DC Goodman shortwall machines, 7½ foot bars, with turntable trucks, non-permissible.

CHARLES E. CAMPBELL

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FOR SALE
BUCYRUS-ERIE 950B SHOVEL

Completely modernized and in A1 Condition.—30 cu. yd. bucket, 150 ft. boom, 72 ft. Dipper handle. Now in operation and may be inspected at SHASTA Coal Corporation mine, BICKNELL, INDIANA.

Available at end of two years or possibly sooner.

SHASTA COAL CORP.

6 No. Michigan Ave.
CHICAGO

3200 Acres Pgh. 28 A deep Mine Coal—Ohio River. Fairfield Conveyor—full hydraulic—35" x 18"—on Rubber. 450 HP Vulcan Dble D Hoist 11' x 32" & Elec. McCarthy H-W Auger 36"—42" hydraulic—Diesel. Coal washer 100 TPH—½" x 3" complete. Monitiwac 4500 Dragline—6 Yd.—Cat. Eng., 1951 Model. Joy Continuous Miner 3 JMC—34" Ht—in 200 Ser. Austin-Western 99 H power grader—hydraulic new

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1200 Woodbourne Ave., Pittsburgh 26, Pa.
LEhigh 1-2254

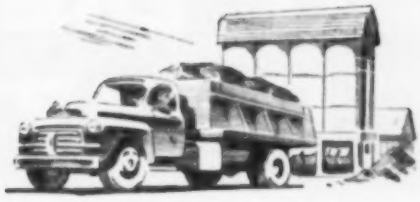
ANNOUNCING

COAL AGE ADVERTISERS IN THIS ISSUE

ADVERTISERS INDEX

EATON 2-SPEED AXLES

keep Trucks on the Job- Reduce Maintenance Costs



By providing a gear ratio best suited for each road and load condition, Eaton 2-Speed Axles permit engines to work in their most efficient and economical speed range, reducing stress and wear on operating truck parts. Truck maintenance is reduced, trucks deliver more on-the-job hours. In addition, because of Eaton's exclusive planetary design, forced feed lubrication, and extra rugged construction, there's less maintenance on the axle itself. When axle repair *is* required, Eaton's down-to-earth design makes the work quick, easy, and economical. Trucks with Eaton 2-Speed Axles last longer, earn more at lower cost, are worth more on the trade-in.

Ask your Truck Dealer for Complete Information.

More than Two Million Eaton Axles in Trucks Today!

EATON AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO

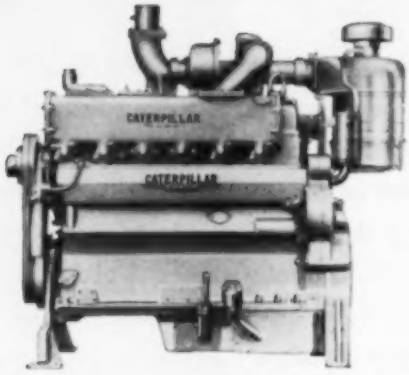
PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

Announcing 2 more new

CAT* DIESEL ENGINES

THE NEW D337

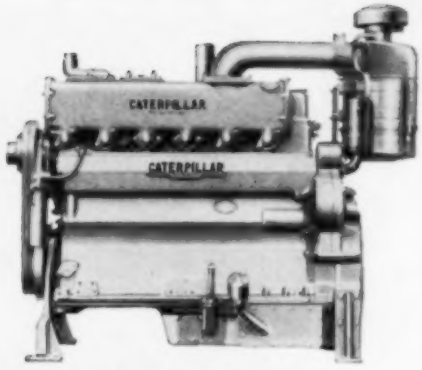
Series F with Turbocharger



310 HP maximum @ 2000 r.p.m.

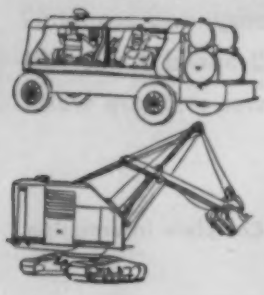
THE NEW D326

Series F



200 HP maximum @ 2000 r.p.m.

MODERN, COMPACT, HEAVY-DUTY UNITS FOR



Conveyors	Mining Equipment
Compressors	Electric Power
Cranes	Auxiliary
Excavators	Full time
Hoists	Portable
Locomotives	Pumping

Rock Crushers

Available as original power in many types of equipment . . . direct drive or choice of transmissions, including hydraulic couplings and torque converters. Also available as Electric Sets and Marine Engines.

CHOICE OF 3 STARTING SYSTEMS

AIR—For fast starts where a supply of compressed air is on hand. Also available: air compressors and storage equipment.

ELECTRIC—Where speed of starting and convenience are important. Also available: automatic start-stop controls which require no operating personnel.

GASOLINE—For all-weather starting. Preconditions the diesel and lubricates before the diesel is started. Also available: electric starters for the gasoline starting engine.

Here are the two newest diesels in the Caterpillar line. They offer you more for your money than *any* engines in their power range. Combining major advances in design with time-tested Caterpillar features, they're built to deliver more power with less maintenance and lower cost. For example:

• New Turbocharger (in the D337 Series F) utilizes exhaust heat to drive supercharger. Delivers air in direct proportion to engine's need. • New hydraulic valve lifters practically eliminate valve adjustment, provide quiet operation. • New, improved water jets for more effective cooling. • Heavy-duty, oil-cooled pistons with chrome-faced rings for longer life. • Sealed cooling system reduces mineral deposits. • Full-flow filtering of fuel and lube oils. • Complete line of attachments to meet all your requirements.

All these and other features add up to a new standard of performance. For details, see your Caterpillar Dealer. You can always count on him for reliable information and prompt service!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NEW D337 Series F and NEW D326 Series F— LATEST EXAMPLES OF CATERPILLAR LEADERSHIP IN ACTION

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CATERPILLAR TRACTOR CO., PEORIA, ILL., U. S. A.

I'd like more information on the new D337 Series F ☐, D326 Series F ☐.

Name_____

Address_____

City_____ Zone____ State_____

Calumet Division, Calumet and Hecla, Inc., Calumet, Michigan

"Cities Service Heat Prover Played A Major Role In Our Expansion Program"

Miners and refiners of copper, the Calumet, Michigan Division of Calumet and Hecla, Inc., relies on two power plants to operate its many mines, reclamation plants, mills, manufacturing facilities and mine rehabilitation projects.

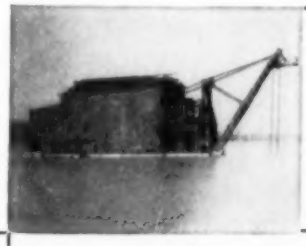
The two plants, located at Lake Linden and Hubbell, were recently brought up to date. The Lake Linden plant now has modern steam generating equipment fired with pulverized coal. The Ahmeek plant was equipped with new coal distributors for its underfeed stokers and new plastic monolithic furnace settings.

This modernization program, along with a planned preventive maintenance program which is now being put into effect, is expected to raise the KW capacity of these plants from 20 megawatts to 30 within the next few months.

The Cities Service Heat Prover has played a major role in this improvement program. It is used extensively to examine combustion conditions in the furnaces, check station instruments, and guard against air infiltration through boiler settings and duct work, thus enabling plant personnel to operate the equipment constantly at design efficiencies or better.

Says Power Superintendent, Robert Hein: "The portable Cities Service Heat Prover has proved invaluable in our operation. We are now using 150,000 tons of coal per year and operating at boiler efficiencies around 86%. By giving us a quick, accurate check on our firing conditions, the Heat Prover has been directly responsible for much of this record."

The Heat Prover is supplied and maintained free by Cities Service. For further information write Cities Service Oil Co., Sixty Wall Tower, New York 5, N. Y.



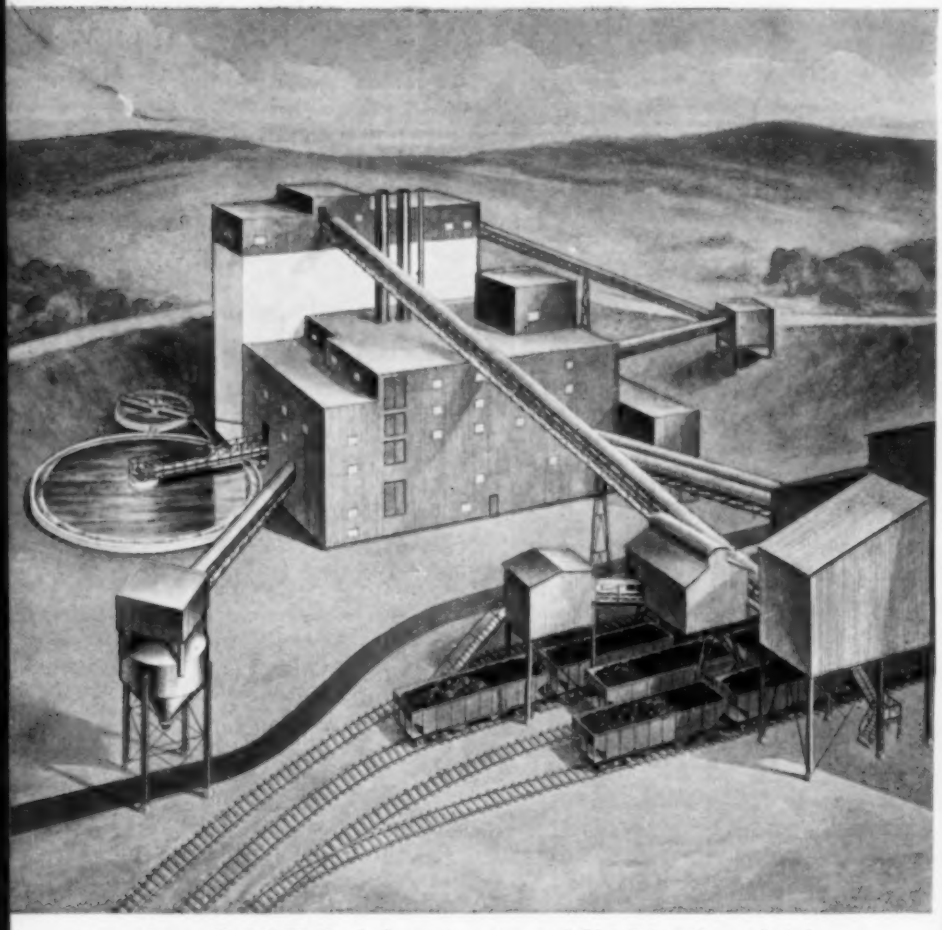
Calumet Reclamation Operation reclaims stamp sands processed years ago and dumped into lake. Further processing will extract copper. For power, dredge relies on the Calumet Division's Lake Linden Power Plant.

Taking Readings With Heat Prover has helped Calumet Division achieve 86% boiler efficiency. Will aid further in raising KW capacity from 20 to 30 megawatts. The unique instrument enables maximum heat benefits from coal.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

LINK-BELT completes single-contract job for entire Joanne preparation plant



JOANNE plant, at Rachel, W. Va., is the most recent example of Link-Belt "turn-key" service. From Pittsburgh Seam, 24" maximum lumps are reduced to 5" x 0" metallurgical and 5" x 0" steam coal. Link-Belt equipment includes complete conveying system, new air-pulsated wash box, two Multi-Louvre dryers, crushers, screens, thickener, feeders, drives.

It's another metallurgical coal plant built and erected by LINK-BELT

HERE's the assignment Sharon Steel Co. handed Link-Belt: Full preparation facilities for handling 350 tph of run-of-mine coal and producing a uniform metallurgical and steam coal, 3.0% moisture content. And from foundation to finished plant, the job was completed under a single, all-inclusive contract.

Basis for this confidence is Link-Belt's previous experience in handling complete metallurgical coal plants . . . plus countless other installations, ranging from individual components to entire modernization plans. And this same dependable equipment and capable engineering provide the low-cost handling and processing procedures that can be arranged to suit your own particular seam and market requirements.

For all or any of these services, call your nearest Link-Belt office. Our coal preparation specialists will gladly analyze your needs, without obligating you.

13,112

LINK-BELT

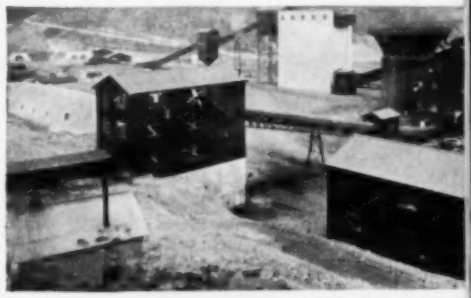
COAL PREPARATION and HANDLING EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Birmingham 3, Cleveland 15, Denver 2, Detroit 4, Huntington 9, W. Va., Indianapolis 6, Kansas City 8, Mo., Louisville 2, Pittsburgh 13, Seattle 4, St. Louis 1, Scarboro (Toronto 13), Springs (South Africa).

Other previous unified-responsibility metallurgical coal plants built by LINK-BELT

ITMANN mine, Wyoming County, W. Va., has a Link-Belt Heavy-Media preparation plant cleaning 6" x ¼" Pocahontas Fuel Co. No. 3 Seam.

PRICE, Ky., is the site of Inland Steel Co.'s model preparation plant, where ash content of 750 tph of raw coal is reduced to 3.5%.



WEIRTON mine—washing and blending plant built by Link-Belt to produce 250 tons of 4" x 0" coal per hour for Weirton Steel Co.

ISABELLA, Pa.—Link-Belt cleaning, drying and blending plant of 300 tph capacity has provided Weirton Coal Co. with a clean, uniform product since 1938.